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THE IRON AGE

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Key TO HIGH PRODUCTION

HERE'S a cutting steel that you can depend on to see you through when conditions bear down hard on tools. Bethlehem Special High Speed Tool Steel is worthy material for the teeth of modern machine tools. It takes the toughest materials in its stride—stands up under the combinations of high speeds, heavy feeds and deep cuts that get the work out on schedule.

Bethlehem Special is being widely used for every type of roughing tool, for twist drills, gear cutters, inserted saw teeth, special dies, woodworking tools, punches and similar

tools. In every application, experienced shopmen praise its uniformly high cutting qualities—the result of Bethlehem's long experience in making fine tool steels.

If high-test iron castings, special steels and similar hard-to-machine materials have been taxing the capacity of your tools and slowing down production, it's more than likely you will find Bethlehem Special an excellent solution to your problem.

Other Bethlehem Tool Steels handle tough tasks in their own fields of application with equal efficiency.



BETHLEHEM STEEL COMPANY

▲▲▲ THE IRON AGE ▲▲▲

JUNE 17, 1937

ESTABLISHED 1855

Vol. 139, No. 24

One Thing Leads to Another

INSTITUTIONAL advertising, as you know, is that in which the intent is not to make sales but to interpret the motive and spirit of the advertiser. And judged by this definition, no piece of institutional copy was ever written which did a more effective job than this one.

It reveals clearly to the public the objective of the unionization movement under the leadership of John Lewis. Dominating the employer is but one of its purposes. Now it is reaching out for new fields to conquer.

This thing has gotten beyond a mere struggle between capital and labor. It has become a threat to impose a labor dictatorship upon the American public.

J. W. Van der Werf

SPECIAL DESIGNATED LIQUOR PERMIT

Notice to All Property Owners In the Pontiac Metropolitan Area

On Monday, May 3rd the undersigned committee of the United Automobile Workers, Pontiac Local Union 159, met with the president of the Pontiac Real Estate Board, the Prosecuting Attorney, the president of the Oakland County Bar Association and a Circuit Court Commissioner.

**The Purpose of This Meeting Was To Secure a
Voluntary Reduction In Rents**

On Tuesday, May 4th this committee met again with the president of the Real Estate Board and two receivers for local banks. All major property owners were invited to this conference.

No Results Have Been Obtained To Date

Rents of members of our union have been increased in some cases as much as one hundred and fifty per cent over that paid one year ago. Average increase is fifty per cent.

The Average Rent Increase is Approximately Fifty Per Cent Higher Than Actual Increase in Earnings.

The United Automobile Workers is Organized to Protect its
Membership

IT CARRIES OUT THIS PURPOSE

If a general rent reduction is not agreed upon by the real estate owners EFFECTIVE WITHIN FIFTEEN DAYS of this date the United Automobile Workers, Pontiac Local Number 159 will expend the entire efforts of its vast membership and resources to right and equalize the high rent situation.

Suggested Procedures Are:

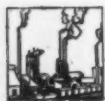
1. DEMAND THAT THE ASSESSED VALUATION OF PROPERTY BE RAISED SO THE RENT INCOME REPRESENTS ONE PER CENT PER MONTH OF THE ASSESSED VALUATION.
2. GENERAL DISCONTINUANCE OF ALL RENT PAYMENTS AS OF JUNE 1ST 1937.

**We Want To Arbitrate the Matter; We're Willing To Do So:
We Must Have Immediate Action!**

Signed: Rent Committee United Automobile
Workers of America, Local No. 159

ODIN H. JOHNSON
General Counsel

CHARLES BARKER, Chairman
IKE MARLEY
JOSEPH QUICK
GEORGE CONNIBEAR



TO judge the market possibilities for steel in air conditioned homes, it is necessary to analyze trends in home building and the public acceptance of air conditioning. There are three clearly defined classes of air conditioning: winter air conditioning in which the air is cleaned, heated, humidified and circulated; summer air conditioning in which the air is cooled, dehumidified and circulated, and lastly, a combination of the two.

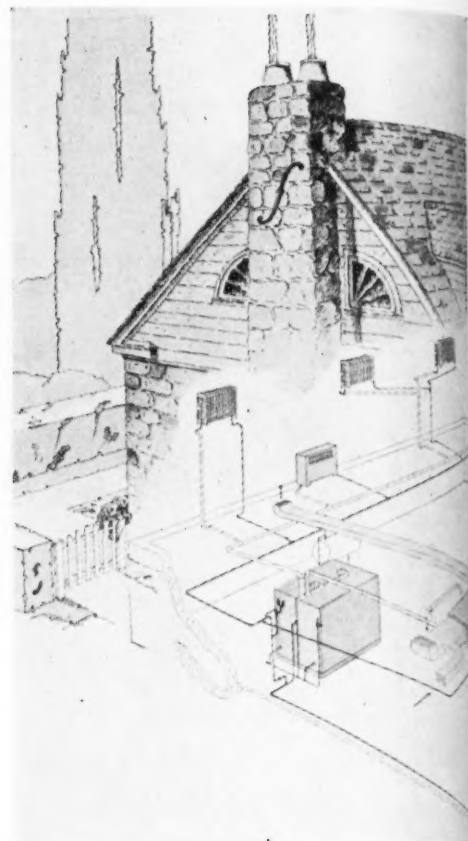
Sales records for the past year show that the requirements for today's modern home call mostly for the winter air conditioning system. As it has been applied up to now, summer air conditioning has largely consisted of circulating cool basement air through the house during the day and night air from the outside after sundown. Most companies have felt that real summer cooling by mechanical refrigeration is too expensive in both initial and operating costs. The Kelvinator Corp., however, has recently set out to build a home that could be erected for \$7000 to \$8000 and yet provide year-'round air conditioning. Compared with the installations made of winter air conditioning, the 50 or so experimental homes built by Kelvinator represent but a small fraction of the total volume, yet the plan is apparently sound and holds great promise.

As the public becomes aware of the comforts that are now available in modern air conditioning at reasonable cost, there is reason to believe that the day is not far off when the purchaser or builder of a new home will demand a modern air conditioning plant for both summer and winter use, in the same way that he demands mechanical refrigeration and a modern bathroom. Mortgage banks and insurance companies will do likewise. In fact, there is one insurance company that has already stated that a mortgage loan will not be made on a new home unless provision is made for installing air conditioning equipment. This does not necessarily mean that the equipment must be in now, but at least the ducts must be in the walls so that alterations at a later date will not be necessary.

Should this idea obtain general acceptance, the obsolescence factor in homes will gain importance.

By ROBERT G. BINGHAM

The Iron Age



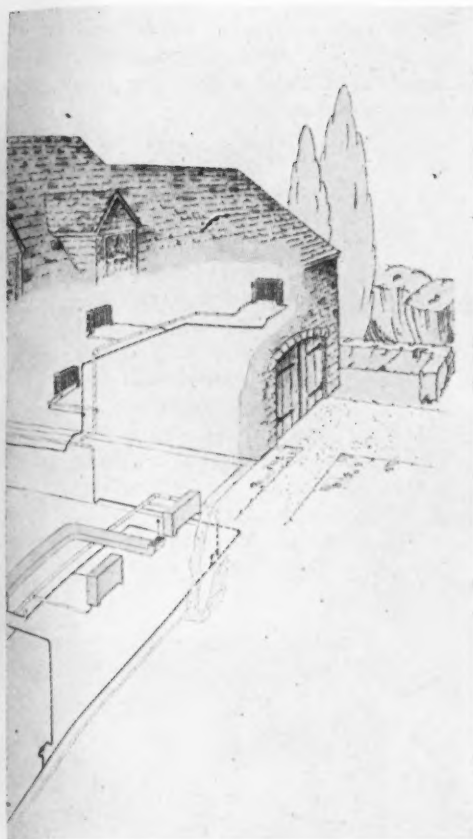
Steel Markets

Air Con

What will the value of a \$10,000 home built 10 years ago be today, if right alongside it is constructed a \$7500 home completely air conditioned for both summer and winter? One answer to the obsolescence factor would be the conversion of old structures for air conditioning use. A limiting factor here, however, is the cost of insulating, weatherstripping and caulking an old building, not to mention the changes that have to be made to the interior if air ducts are not already installed. This expense often exceeds the entire cost of an air conditioning unit. Consequently, often only the first floor is conditioned.

Domestic air conditioning is to-

day in about the same stage as mechanical refrigeration was when it was first introduced. Initially, compressor units were installed in the basement and evaporator coils were placed in the old ice-box. Today it is found to be much more economical to design a refrigerator cabinet from the ground up for the mechanical unit. Hence the largest market for air conditioning is looked for in new structures. One seller estimates installations are running three to one in favor



TWO-PIPE vapo-orifice system, which is automatically fired and is a part of the American Radiator Conditioning System. Illustrates method of combining air conditioning with radiator heat.

000 homes a year could be constructed without overtaxing the demand for them. As to what percentage of these new homes should be air conditioned in one of the three ways mentioned, no one can be sure. One furnace builder of 40 years' experience, who has entered the air conditioning field, is not willing to make any prediction, since he has seen how fickle public opinion is where choice of heating units is concerned. If the experience of the past year were available, it might give some clue as to the possible future market, but there has been no unified collecting agency for data of this kind and individual companies seem reluctant to give out figures on sales. What seems to be true, however, is that the idea of air conditioning is being applied much more rapidly in the Middle West than it is along the Atlantic seaboard.

Detroit a Good Market

One of the most active cities in this connection is Detroit, where it is estimated that out of 4000 new homes constructed in 1936, approximately half were winter air conditioned. Practically no installations have been made in homes selling under \$7000, whereas it is expected that this year will see a considerable boom in lower cost homes. On this basis it is expected that the percentage of houses being air conditioned will be reduced, although the number of units will actually increase over last year.

With the exception of one of the pioneering companies in the industry, the Carrier Engineering Corp., it can be said in general that most of the companies that have entered air conditioning in the last few years have been those which started in supplying oil burning furnaces or conversion units. Because such a furnace is inherently more costly than the conventional coal-fired type, it has tended to make air conditioning units built around such furnaces available only in the higher priced homes. For a \$7000 home, for example, complete installation including the unit and ducts averages 8 to 10 per cent of the total cost. There are several companies, however, that have made available air conditioning units built around coal-fired units. It is expected that this class of manufacturer will be able to capitalize on the lower-priced homes that are going to be erected in 1937. In this connection it might

in Domestic ditiioning

of the new home, whether for summer only, or summer and winter.

Will Depend on New Homes

Naturally the market for air conditioned units in homes will largely depend upon the number of new homes constructed, although the conversion of old type heating plants to modern equipment will undoubtedly receive an impetus in 1937, in line with the general loosening of the purse strings for home modernization and improvements.

It is estimated that in 1936 less than 5 per cent of winter air conditioning equipment was installed in existing homes, but some sales managers are optimistic enough to believe that in 1937 this may rise several fold. According to one company, the ratio of winter installations in new homes in comparison to old homes is probably 50 to 1 in favor of the new dwellings.

Approximately 200,000 new homes of all descriptions were constructed in the United States in 1936. A conservative estimate is that at least double this number will be constructed in 1937. In fact, a recent report of the United States Department of Labor indicated that during the next decade, 750,-

be noticed that the Committee for Economic Recovery estimates that 80 per cent of the homes in this country are built to sell under \$6000, so that if a mass market is to be developed for air conditioning, the price must be brought down low enough to reach people in the lower income brackets. Much of the market possibilities in the coming year depend, therefore, upon the wider development of low-cost units.

Rising Building Costs

A very important factor that will tend to limit the market for air conditioning this coming year is rising building costs. Homes that could be built for \$10,000 two years ago cost \$12,000 now, largely because of increased wages in the building trades. Yet the average home buyer still figures that he can get the same type of house for \$10,000. The result is that cost corners must be cut wherever possible and one of these corners may result in the elimination of air conditioning apparatus and the substitution of a gravity hot air system, for example, where it might not be considered under other circumstances.

Incidentally, in order to reduce costs, Gar Wood has developed what is known as an "Airdux" system consisting of pre-designed standard panels, trunks and risers. Run-outs from the trunk lines to the grilles are limited to four sizes of a single depth to fit a standard 2 x 4 in. partition. Every trunk line is standardized and there is one standard sized panel for each

depth. Balance and distribution of the air is obtained by regulation at the grilles.

Mention should be made of Gar Wood's conditioning unit, since it is composed of so many steel parts. The oil burner unit itself is of welded steel construction. The fire bowl is of hot-rolled steel, brick lined, and the fire box proper, as well as the economizer unit, is of copper-bearing steel. The blower is also of sheet steel construction, while the exterior case is auto body stock with a lacquer finish.

Welded steel construction is also used in a gas-fired unit made by the company. Gar Wood's air conditioner weighs 1700 lb. in the smallest unit including the fan and motor weight, and is made almost entirely of steel. This company, incidentally, sold approximately \$1,000,000 worth of air conditioning equipment in 1936.

Coal-fired air conditioning apparatus is also being made of pressed steel construction. The Ideal Furnace Co., for example, makes both the furnace and radiator of heavy copper-bearing steel. This radiator is a fully baffled tube type and is welded integrally to the furnace casing, which makes it the connecting piece between it and the chimney. An oil burner unit is made by the company of similar construction, although the shape of the combustion chamber is quite different. In either case, the cabinet is of 20 gage furniture steel. These air conditioning units provide a filter bank of glass wool, a centrifugal type blower fan with capacitor motor and humidifier

trays with automatic water level control. The same company also makes a unit with a cast iron furnace section.

Year-'Round Conditioning

One company that has made careful analysis of the field of year-'round air conditioning and has made a first approach to meeting the problem is the Kelvinator Corp., Detroit. Kelvinator started out to build air conditioning units for homes in the \$10,000 class and up. Since less than 10 per cent of American homes come within this classification, however, the company sought to broaden its market by trying to reach a large proportion of that other 90 per cent. It was its purpose to bring air condition-



ONE method of cutting costs is to so as to give flexibility for room Airdux system being installed

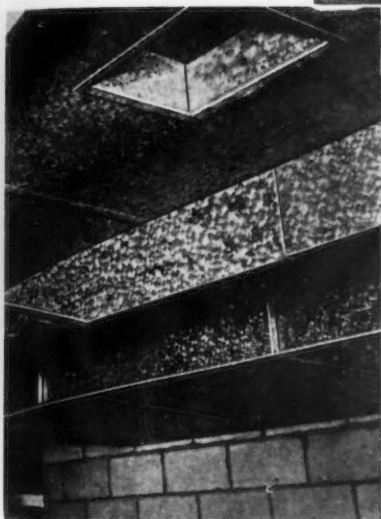


CARRIER'S summer air conditioner, which requires neither water nor drain connection, and may be plugged into a wall socket as easily as is a radio.

o o o

YEAR - 'ROUND air conditioning has been brought down to houses selling in the \$7000 to \$8000 range by the Kelvinator Corp. Pictured here is one of the six-room Kelvin homes.

o o o



employ pre-designed air ducts in units requirements. This is the Gar Wood in the basement of a home.

ing within the range of families earning \$2500 a year and up. It was felt that if such a home could be built for \$6000 to \$7000, exclusive of the lot, it would come within the range of carrying charges of people in lower income brackets. The company sought to include year-'round air conditioning, with electric cooking and refrigeration in a so-called "package." Initial cost of mechanical equipment had to be consistent with the total building cost and, more important still, the operating cost had to be consistent with the owner's budget.

The Kelvin home, which was recently introduced, is designed as a unit for living, and it meets such limitations as to first cost and operating expense. The package itself

sells for about \$1200, or 16 per cent of the total building cost. Operating expenses are about \$185 a year for the 6-room unit. Standardization of floor plans, with different elevations, standardization of duct work and coordination of the various mechanical trades was largely responsible for this low cost. Yet despite this standardization, the greatest possible flexibility of exterior is available. By the use of different facing materials and different periods of architectural style, a complete and striking variety of design has been attained.

No attempt has been made to incorporate ultra-modern ideas that have not as yet met with general acceptance, as attention is meant to be focused on the air conditioning, and not the design, which is that of a conventional six-room house with three bedrooms upstairs and a full-sized basement. The windows all open, although it is expected that after people have lived in the homes for a month or so, they will get used to the modern conception of air conditioning, where no outside air is admitted without first having been passed through a filter and where the bulk of the air is recirculated. One of the arguments in favor of the air-conditioned home is that it reduces the cleaning bill and for the same reason is a godsend to the victim of hay fever and asthma. Air pollution, especially from plant

pollen, can be eliminated by means of any of the various types of summer or winter air conditioning plants.

Insulation Important

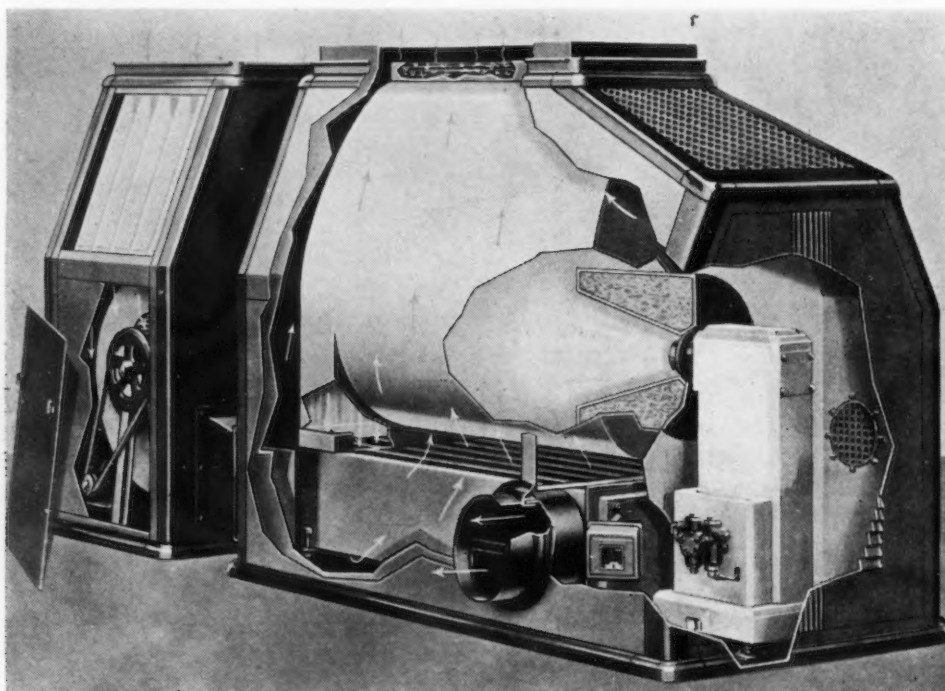
The Kelvinator unit provides heating and humidification in winter, and through the same ducts in summer provides dehumidification and cooling. In order to keep down the cost of operation in summer, a great deal of reliance is placed on the insulation of the building, which prevents the inflow of heat during the hottest part of the day and permits of radiation of this heat at night. There is no attempt at 100 per cent refrigeration, which would be too costly. Instead, the object is to produce a differential of approximately 8 to 12 deg. under the outside air, and means is provided to circulate cold night air through the building without running the refrigeration unit.

Kelvinator's oil burner is in a cast iron boiler, which is sheathed with a sheet steel lacquered case, and it is combined with a 66-gal. galvanized steel tank for a year-'round supply of hot water. In this particular system air is drawn by means of a fan across either indirect heating or cooling coils, depending upon the season of the year. These coils are copper-fin type and are connected respectively to the boiler unit or to a refrigerator compressor located nearby,

so that the market for copper tubing will also be enhanced, as it will be in the case of sheet steel in this new air conditioning development. Kelvinator's heat and cold exchanger is encased in an angle iron frame sheathed with sheet metal and suspended from the ceiling. Individual control of each duct is provided by dampers located in the basement.

Long potent in the field of heating by radiation, the American Radiator Co. has placed on the market a new air conditioner which is specifically designed to operate in conjunction with radiator heating systems to supply humidification, air circulation, air cleansing and ventilation. Provision for the cooling and dehumidification of air may be made, if such

known as the "Arco" air conditioner, is made of green enameled furniture steel and contains an air filter, a spray for washing and humidification, a tempering coil to warm outside air and eliminate entrained moisture, and a blower. The unit may be installed along with the regular heating system, oil, coal, gas or coke, as the case may be, or it may be



HEATING units account for more steel than do the ducts of an air conditioning system. In this Gar Wood unit, the fire box and economizer tubes are of welded-steel construction, while the double-walled case is made of lacquered auto-body sheets.

As has been mentioned before, Kelvinator's approach to this air conditioning market is through the adoption of a pre-engineered home that is flexible enough to be adapted to individual requirements. For each of its three units there is a definite number of square feet of wall radiation and window losses, so that a single mechanical unit will be in engineering balance in 40 individualized treatments. It was found that it would cost almost three times as much to provide air conditioning for an unstandardized six-room house which had been improperly engineered from this point of view.

This entire program is being put across on a national basis through the cooperation of the public utilities. The home owner may select his own builder, but the company insists that registered architectural supervision be provided to insure that construction conforms to the fundamental and basic specifications of the Kelvin home.

is desired. This is an example of the combination system, since the heating is left entirely to the radiators, which are sized according to individual room requirements. Sales arguments for the use of the two, rather than one summer-winter air conditioning system, as is offered by other companies, are based on the fact that by making the conditioning and heating interacting, yet subject to independent control, it is possible always to maintain a supply of conditioned air, while the heat may be carried in accordance with outside weather conditions. The company states that in previous air conditioning where the heat and conditioned air were delivered together, the heat supply could not be altered without starting and stopping the air supply, whereas with this system outside air taken in for ventilation need be heated only to room temperature, and not super-heated in order to warm the room as well.

The American Radiator product,

added later, without the necessity of tearing down walls or increasing boiler capacity. Ordinarily the conditioner is suspended from the ceiling of the basement, but it may be hung from the ceiling of a room or installed in the attic. One air main, with a grille on the first floor, is said by the company to be capable of supplying all rooms in an average house with conditioned air. One return grille takes care of the used air.

The underlying basis of selling the combination of radiator and air conditioner is the principle of radiated heat, which holds that abnormally warm air, if the walls of a room are below normal temperature, will still feel chilly to those occupying the room, while the reverse, warm walls and cool air, will provide a comfortable atmosphere. Radiant heat comes only from some hot object, such as a radiator, and since it travels only in a straight line, it follows that each room must contain a radiator

in order to benefit from radiant heat, or so American Radiator claims.

In order to introduce this system properly, American Radiator is spending over a million dollars this year, an increase of 35 per cent over last year's budget, on a nationwide advertising campaign. Insertions, which will run in house and general magazines and over 600 newspapers, will be directed particularly toward new homes to be built during the coming year, and later, in the fall after the close of the building season, will stress air conditioning for modernization.

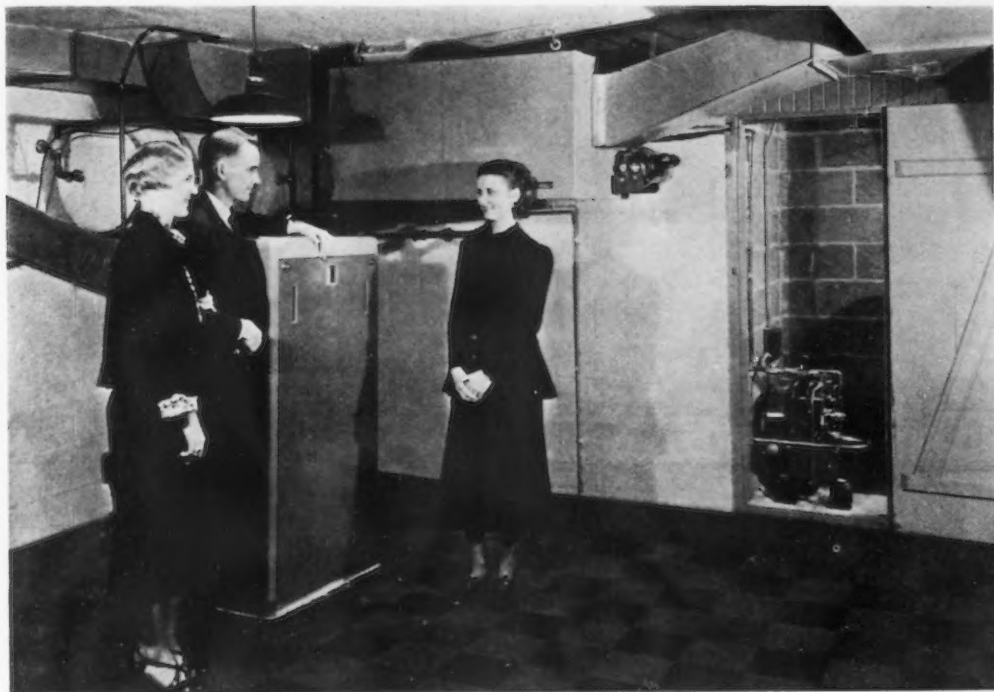
Some other companies prominent in the effort to get air conditioning across to the general public by advertising are: Delco-Frigidaire, the air conditioning division of General Motors, which features "controlled-cost air conditioning" for business and household installations, forced warm air systems, that condition the air and heat it

A new type "all-in-one" summer air conditioning unit, of such compact design that all machinery, including compressor, motor, condenser and cooling coils, is contained in one cabinet which covers only 20 in. by 33 in. of floor space, has been introduced by Airtemp, Inc. Designed to sell for a moderate price, and intended to be used in small shops, stores, restaurants and offices, this unit will clean, cool, dehumidify and circulate 1200 cu. ft. of air a minute. Claiming to incorporate the advantages of a duct system, the new unit stands 7 ft. 6 in. in height and provides for overhead distribution of air from a diffusion type grille near the top. Its secret of compactness lies in a new reciprocating type radial compressor, designed to fit within the base of the cabinet. Suspended on rubber mountings, it is said to be unusually quiet and free from vibration. An important feature of the new unit is its portability, which allows a merchant

the first recognition of air conditioning as a distinct art in the engineering profession. Although since that time many of the world's largest and most prominent installations have been made by this company, it is now heading into the domestic air conditioning field and has made considerable progress in that direction.

In the Carrier scheme, the principles embodied in his "rational psychrometric formulae," presented over 25 years ago, still form the basis of the company's operations. These consist of the control of temperature and humidity, ventilation, even distribution of air, and cleansing the air. To attain these ends in moderate-sized homes at a comparatively low cost, the Carrier home air conditioner has been designed. This is a central plant requiring a duct system for the distribution of the air, is flexible in design, and is adaptable for use with either oil or gas fuel. Provision has been made for the inclu-

• • •
OIL burner, year-round hot water tank, and heat and cold exchanger, combined with a humidifier hung from the ceiling, comprise the main elements of the Kelvin unit. Compressor and condenser unit for summer cooling can be seen inside the doorway to the right.



• • •
at the same time, and electric room coolers for one or several rooms; Carrier Engineering Corp., Newark, which has many of the largest and best known air conditioning installations in the world to its credit; Kelvinator; General Electric, which offers an oil-fired warm-air conditioner; The Trane Co., La Crosse, Wis.; Airtemp, Inc., Chrysler Corp. subsidiary, and the York Ice Machinery Corp.

to take it with him from one building to another and locate it anywhere on his premises he may desire, only electrical and water connections being necessary.

The Carrier Engineering Corp. attained fame because its founder, Willis H. Carrier, in 1911, was requested by the American Society of Mechanical Engineers to prepare a paper on air conditioning, thus marking what was probably

sion of a cooling coil in case summer air conditioning is desired. Carrier also provides home air conditioner units for individual rooms which may be used in houses already equipped with hot water or steam heating systems. This enables the conditioning of air in selected rooms, while the garage, kitchen, baths and other rooms may be warmed by direct radiation. In

(CONTINUED ON PAGE 124)

Slag Viscosity Control for



FIG. 1—Measuring the fluidity of the slag.



ALTHOUGH frequently faced with wide variations in the composition of his charge the basic open hearth operator is called upon to produce a steel that will meet specifications within comparatively narrow limits. One of the essential requirements to success in this respect is the ability to produce consistently a type of slag, which, regardless of the variations in the charge, will give the desired quality of the steel.

The oxidizing condition which prevails in an open hearth furnace results in a partial removal of the carbon, phosphorus, manganese, and silicon in the charge. The oxides of the latter three elements float out of the steel and form a slag. This slag also contains a certain amount of iron oxide, resulting from the oxidation of the steel itself. To hold the phos-

phorus in the slag in a stable condition the presence of a strong base is essential. For this purpose limestone or burnt lime is added to the heat. The extent of the elimination of phosphorus depends on the degree of oxidation and the basicity of the slag; a strongly basic slag is also essential for the removal of sulphur from the metal.

The basicity of the slag has a pronounced effect on the quantity and the action of the iron oxide in the slag. Generally speaking, a highly basic slag tends to give a high iron oxide content at the end of the heat, whereas a weakly basic slag is usually accompanied by a low iron oxide.

The problem in basic open-hearth practice then is to attain the happy medium of a slag which will be basic enough to eliminate phosphorus and sulphur to the desired extent, and yet not too basic, so

IRON oxide in basic open-hearth slag may be held within narrow limits by controlling the fluidity and basicity of the slag. VisControl, the new method developed by Bethlehem metallurgists, makes this possible. Greater uniformity and cleanliness of the steel, less waste of iron in the slag, and savings in limestone and deoxidants are some of the benefits accrued.

that the slag will have the right viscosity and FeO content. By means of VisControl the viscosity and hence the basicity and FeO content can be conveniently and accurately controlled in the heat, as soon as a slag begins to form.

The rate at which the metalloids are oxidized and eliminated from the metal bath is also greatly affected by the fluidity of the slag. An extremely viscous slag, even though it may have a favorable composition, does not permit the necessary contact between the reacting components of the charge. For this reason it is necessary that the slag be kept sufficiently fluid to permit free interchange between slag and metal.

Proper Relations Necessary

It is thus easily understood that a proper relation between basicity, iron oxide content, and viscosity of

Greater Uniformity in Steel

the slag is essential to efficient operation. Another important essential is that the slag-forming additions are made early in the heat, and that solution of these materials is insured in the time allowed; corrective additions made after the slag has begun to "shape up" do not have the same beneficial effect.

Such a control of the basic open hearth slag has recently been perfected by the research, metallurgical and open hearth staffs of Bethlehem Steel Company. Viscontrol, as the method is called, is now used for the regular basic open hearth furnaces in all Bethlehem plants. Extensive research has demonstrated that the composition of the slag during the melting period can be qualitatively determined by measuring the slag viscosity. From this the composition of the final slag can be quite accurately predicted provided that the proper additions based on the slag viscosity test are made.

The instrument used for measuring slag viscosity, shown in Fig. 1, consists of a rectangular steel block with a well at one end. A $\frac{1}{4}$ inch hole extends from this well to the end of the block, a distance of 10 inches. Slag is dumped as quickly as possible into the well and flows into the $\frac{1}{4}$ inch hole; the distance which the slag flows is a qualitative measure of the fluidity of the slag. A heavy slag will flow a maximum of about 2 inches, a creamy slag 2 to 4 inches, and a thin slag 4 to 10 inches.

The general procedure of Viscontrol is as follows: Limestone is charged in varied amounts according to an estimated silicon content of the charge. When the scrap is partly melted the hot metal is added and a short time thereafter the first helper takes a slag viscosity test. One-half hour later he takes another test, and with it a metal test. The two tests are sent

o o o
By C. H. HERTY, Jr.
Development and Research Department Bethlehem Steel Co.
o o o

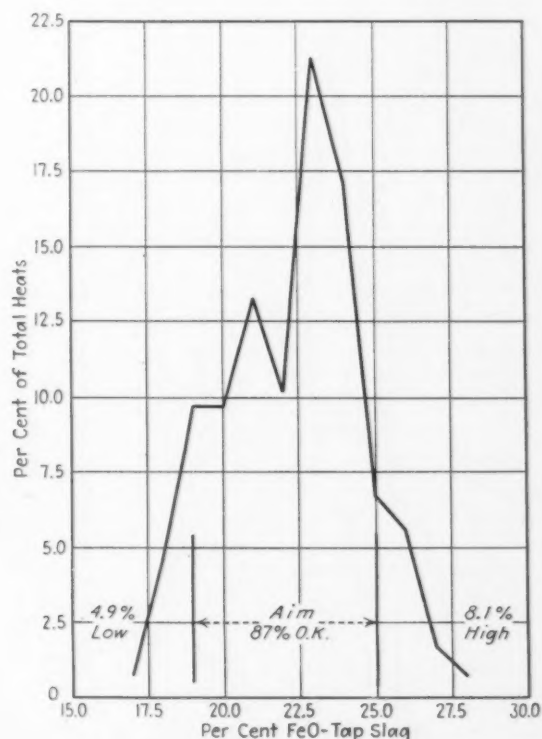
to the laboratory and reported back before the heat melts. Viscosity tests are then continued at frequent intervals until the heat is melted. Metal and slag analyses and the results of the viscosity tests are then referred to the proper schedule from which the basic or acid additions to be made are read. The additions are put into the furnace as quickly as the melter thinks possible, and the heat

is then worked in the normal way by the first helper. Certain variations in making up and using the schedules are necessary at the various plants to take care of local conditions.

The narrow limits within which it is possible to keep the FeO content of the slag by the VisControl method is clearly demonstrated by Table I, giving the FeO content in tapping slags on consecutive heats on four open hearth furnaces operating on structural steel (permissible range 12 to 16 per cent FeO). The results for furnace No. 4 are particularly interesting because they show the erratic behavior of the slag prior to the introduction of VisControl.

For slag low in FeO the permissible range is 4 per cent. Structural steel, for instance is generally made with a slag containing 12 to 16 per cent FeO, and certain forging grades with a 14 to 18 per

o o o
FIG. 2—Distribution Chart showing the percentage of FeO in tap slags over a period of one month, producing rimmed steel with 0.07% max. C.
o o o



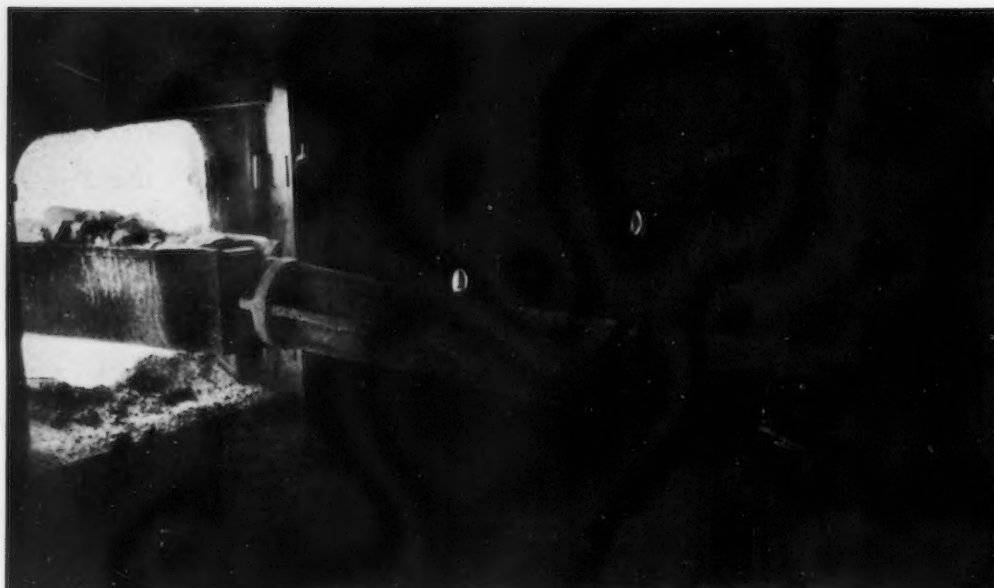


FIG. 3—Making an addition of lime.

cent slag. As the FeO content goes up the range is increased; rails call for a 15-20 per cent slag, sheet products of various kinds 19 to 25, 20 to 26, or 21 to 27. An illustration of the ability of the furnace operator to keep within these specified ranges is given on Fig. 2, a graphical presentation of the percentage of FeO in tap slags made over a period of one month, producing a 0.07 max. C rimmed steel. In 87 per cent of the heats the slag was within the specified limits.

The actual variations in the silicon content of the pig iron during this period is shown in Table 2. The uniformity of the finishing slags as indicated by Fig. 2 shows that the VisControl schedules have properly compensated for considerable variations in the silicon content of the iron.

The fact that VisControl makes it possible to operate with the lowest content of FeO in the slag that will give the desired removal of phosphorus and sulphur has important bearing upon the subsequent deoxidation of the steel. As the available iron oxide in the slag decreases, the amount of deoxidizer required is reduced. Furthermore, the reoxidation of the metal by the slag, in the ladle, is greatly minimized. The latter is particularly serious for low carbon steels when the slag is very fluid and high in FeO. A ladle reaction causing a marked decrease in manganese content frequently occurs under such conditions. With VisControl it is possible to maintain constant ladle

conditions during the entire teeming period, so that the ingots poured last show little or no difference in analysis and physical properties from the first ingots of the heat.

If the slag is too highly oxidizing the rate of carbon elimination may also be so rapid that it is difficult to arrive at the proper carbon and manganese contents of the finished steel, particularly with

steels which are not dead killed in the furnace.

The oxidation conditions of metal and slag also have a marked effect on the efficiency of the aluminum added in the ladle to give the proper grain size, as well as that of easily oxidized alloys, such as chromium.

A uniform slag oxidation from heat to heat should inevitably lead to the best standardization of de-

Table 1—FeO in Tapping Slags on Consecutive Heats on Four Open Hearth Furnaces

Structural Steel				
FURNACE NO.				
1	2	3	4	
VisControlled	VisControlled	VisControlled	Not	
Heats	Heats	Heats	VisControlled	
15.2	14.0	14.9	17.3	
12.0	12.6	15.0	13.6	
16.0	15.0	12.8	14.3	
14.6	15.7	12.2	19.5	
12.7	14.9	16.0	19.1	
14.1	13.3	15.8	16.2	
13.7	11.2	15.1	21.2*	
16.2	14.3	15.6	13.1	
13.8	17.8	14.8	12.8	
13.1	12.2	13.9	13.3	
13.6	16.1	15.0	13.5	
14.5	10.9	15.7	13.8	
13.0	11.0	12.0	14.3	
13.0	13.0	13.8	15.3	
11.5	Furnace off	14.3	14.3	
13.5	...	14.0	13.6	
13.5	...	13.3	12.2	
14.4	...	12.6	...	
Averages	13.3	13.1	14.3	17.3 first 7 13.6 last 10

FeO = Total Fe expressed as FeO.

* VisControl schedule put on this furnace starting with next heat.

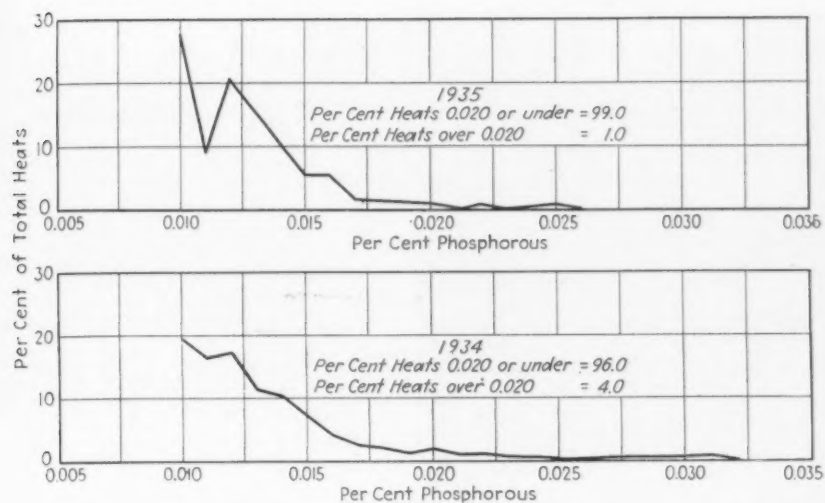


FIG. 4—Comparison of phosphorous distribution in Tee rails; 1935 with VisControl, 1934 without.

oxidation practice, with its attendant increase in the quality of the finished product. In all grades of steel today many qualities are desired which are believed to be affected by oxidation and deoxidation, and uniform practice should lead to a more rapid solution of many metallurgical problems than

Control is the high degree of uniformity in steels made to the same specification, not only in successive

heats in one and the same furnace, but for every furnace, in every plant where this control is used, regardless of the analysis of the charge and of other local conditions which may prevail. An illustration of this remarkable uniformity is furnished by the analysis of the slags from four different Bethlehem plants, operating on 0.10 per cent max. C rimmed steel. Although the raw materials to these plants varied widely, the average yearly FeO content in the slags was 21.9, 22.7, 21.9, and 21.6 per cent, respectively, a remarkably close agreement.

A further illustration of this uniformity is presented by the fact that the number of heats outside the carbon and manganese specifications, over a year, dropped more than 30 per cent at one plant, when VisControl was introduced. The curves in Fig. 3 show the phosphorus distribution in Tee rails for

Table 2—Variation in Silicon in Pig Iron During Period Referred to in Fig. 2

% Silicon	No. of Casts	Per Cent of Casts
Under 0.60	50	11.4
0.60 - 0.79	163	37.1
0.80 - 0.99	176	40.1
1.00 - 1.19	42	9.6
1.20 - 1.39	6	1.4
1.40 or over	2	.4
	439	100.0

if a wide variation in these two items were prevalent.

VisControl also makes it easy to get any desired range of oxidation. If, as time goes on, it is found that one degree of oxidation is better than another, the slag control schedule can be automatically adjusted to give the desirable degree of oxidation.

One of the important factors affecting the cleanliness of steel is the oxidation of the metal prior to deoxidation. The lower the iron oxide in the metal entering the ladle, the cleaner the steel.

An important advantage of Vis-



FIG. 5—Observing the condition of the slag.



FIG. 6—Tapping open hearth furnace.

1934 and 1935. With VisControl, in the latter year, 99 per cent of the heats analyzed 0.020 per cent phosphorus or less, against 96 per cent in 1934.

While it is undoubtedly true that the physical properties of steel could be determined from the complete chemical analysis, if such an analysis were available, there are certain properties which cannot be fully predicted on the basis of the variations in the elements included in the standard analysis. As long as this situation exists, the question of uniformity becomes the more important. A steel made under the standardized conditions of VisControl will respond more uniformly to heat treatment, drawing, forging, and machining. The manufacturer is thus able to adjust his fabricating methods to conditions which do not change materially from time to time.

IN riveting the 12½-ft. lapstrake sailing dinghies here illustrated, the Herreshoff Mfg. Co., Bristol, R. I., is utilizing a high-speed air tool in place of more traditional manual methods. These dinghies are fastened with copper rivets and burrs, the rivet being headed over to make a more secure fastening. This was formerly done manually by means of a small peening hammer with a round piece of metal to back up the rivet. By using the air tool shown in the illustration (the Kipp air chipper, made by the Madison-Kipp Corp., Madison, Wis.) together with a special tool made in the Herreshoff shops, this riveting is done much more quickly and with more uniform results.



Grinding of Cemented-Carbide Milling Cutters



SOME of the problems encountered in grinding milling cutters tipped with cemented carbides, not encountered when grinding high-speed steel cutters, were described in a paper by Hans Ernest and Max Kronenberg of the Cincinnati Milling Machine Co., To produce a clean, sharp cutting edge with correct angles economically and without cracking the tip, special grinding wheels and devices and a rigid tool-grinding machine, in good condition, are required.

The average Brinell hardness for high-speed steel is approximately 650; while, in the case of tungsten carbide, it is as high as from 1500 to 1800. Machinability of a material decreases rapidly with increased Brinell hardness. Thus when grinding tungsten carbide, the grinding wheel breaks down more rapidly than with high-speed steel.

Because of the relative brittleness of cemented carbides, grinding must be done by removing a little material at each pass without trying to take the metal off too fast. Pressure between the tool and the grinding wheel must be light, and a constant motion in the direction of the feed must be maintained, to prevent localized heating. The maximum permissible runout of a milling cutter having inserted

blades tipped with the so-called "hard metal" is less than with high-speed steel blades, because the former are much more sensitive to overloading.

Abrasive Wheels

The relative hardness between work and wheel depends both on the hardness of the wheel and its speed. The higher speed, the greater the apparent hardness. Providing a constant wheel speed is, therefore, desirable. When grinding on the periphery of a disk wheel, the diameter, and, hence, the surface speed, decreases rapidly due to heavy wear. With a cup wheel, however, the speed remains constant, regardless of the rate of wear. It is, therefore, to be preferred for grinding cemented carbide.

Use of cup wheels, however, involves a disadvantage due to the area of contact between wheel and work. For the cup wheels, the contact between the side of the wheel and the tool is in a plane, which increases the danger of cracking or checking the tip. This area, however, can be reduced by crowning the side of the cup wheel slightly, and its effect can be minimized by selecting the correct grade. Thus, for larger diameters, or where the wheel face is not crowned, the wheel should be softer and the grit coarser than in a disk wheel. Wheel diameters between $3\frac{1}{2}$ and 5 in. are recommended.

Present practice with the special abrasive wheels developed for grinding cemented carbides is to

use a wheel speed of from 3500 to 5000 f.p.m. The trend, however, is toward the lower speed, in view of the reduced heating and the better finish that is obtained.

The main factor determining the selection of a grinding wheel is the hardness of the material that is to be ground. The harder the material, the softer and finer must be the grinding wheel, but, as yet, no definite relation based on scientific investigation is known. The softer the bond the easier the grits can break out. When grinding cemented carbides, the grits break out more readily than with high-speed steel, because, in the latter case, with the softer material, the grits do not dull so quickly. As the grits become dulled, the space available for cooling decreases, thus further enhancing the likelihood of loading.

The tendency, however, seems to favor dry grinding, if the correct wheel speed and machine are being used. In any case, the use of only a small quantity of coolant must be avoided. A large quantity of coolant, however, prevents the operator from watching the grinding process and the sparks.

Grinding-wheel manufacturers have developed wheels for grinding hard metals. These wheels are from a special grade of silicon carbide that is hard and sharp, while the bond gives an open porous structure, necessary to provide good cutting qualities.

Diamond Wheels

Since the advent of cemented-carbide cutting tools, the life of a

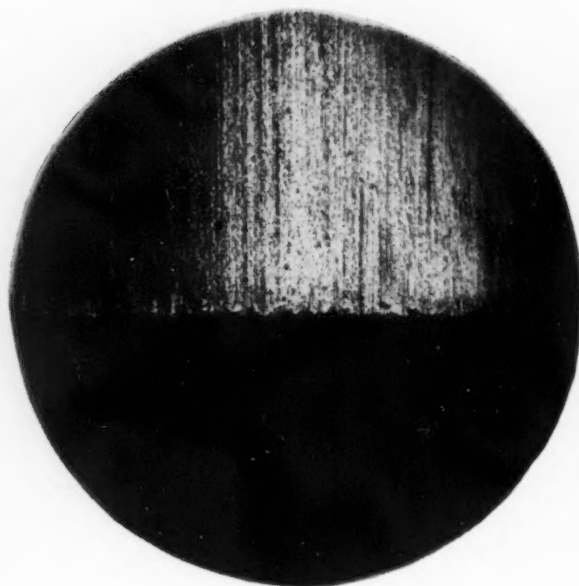
tool has repeatedly been shown to depend largely upon the keenness of the cutting edge and the smoothness of the face. Under the microscope, the cutting edge appears as an irregular saw-tooth line, even when ground with a fine-abrasive wheel. In service, the projecting portions produce irregularities in chip flow, with localized high stress concentration, thus causing an irregular breakdown of the cutting edge. With the fracture of each particle, the rate of breakdown increases, due to the heating and erosion produced by the metal escaping through the crevices. This condition is further aggravated by the resistance to chip flow caused by the roughness of the tool face.

To minimize this effect as much as possible, the cutting edge and face were generally lapped either by hand or by a cast-iron wheel charged with diamond dust or fine abrasive. This has led, in turn, to the development of the diamond finishing wheel. Fig. 1 shows the appearance under the microscope of a cutting edge that has been finish-ground with a fine-abrasive wheel, while Fig. 2 is a photomicrograph of a similar edge ground with a fine-grit diamond wheel. The improvement in the latter case is obvious. Diamond wheels are made from genuine diamonds that have been crushed by a special process, graded through a series of standardized screens, and mixed with a special bond. This mixture is then coated in various thicknesses, ranging from 1/32 to 1/2 in., on the sides and periphery of a backing wheel for side or peripheral grinding, respectively. Diamond wheels are made in grits from 100 to 400.

Coolant must be used with a diamond wheel. This is usually oil, although kerosene and other fluids have been successfully used. A special felt pad may be provided to supply the correct quantity of coolant. The cutting speed for diamond wheels should be approximately 50 per cent higher than that of abrasive wheels. Diamond wheels can be cleaned by a pumice stone.

Cutting Angles Require Standardization

No standard practice regarding cutting angles has been agreed upon by makers of milling cutters either in America or abroad. The clearance angles should be as small as possible to avoid the tendency



CUTTING edge
finish ground
with a fine abrasive
wheel (100X).

to chatter which is often the cause of cutting-edge breakdown. All angles, however, should be standardized wherever possible. In any event, a special cutter-clearance protractor should be provided, and the angles should be measured carefully and recorded for reference. Results will then indicate desirable practice.

Considerable variation in practice exists in regard to the form of the cutting edge. One form has only one main cutting edge inclined at an angle of 30 deg. to the axis of the cutter. This obviously reduces the time required for grinding and avoids the crowding of the chip which exists when two main cutting edges are used.

Two clearance angles are recommended for both the major and the minor cutting edge. The reasons for the secondary clearance angle are as follows:

- (1) To permit use of small primary clearance angles, yet avoid interference between the back of the tool and the work.
- (2) To obtain a larger included angle at the cutting edge, thus providing better heat conductivity and support of the cutting edge.
- (3) To prevent contact of the abrasive finishing or the diamond wheel with the steel blade, which would cause wheel loading and a bad finish on the tip.

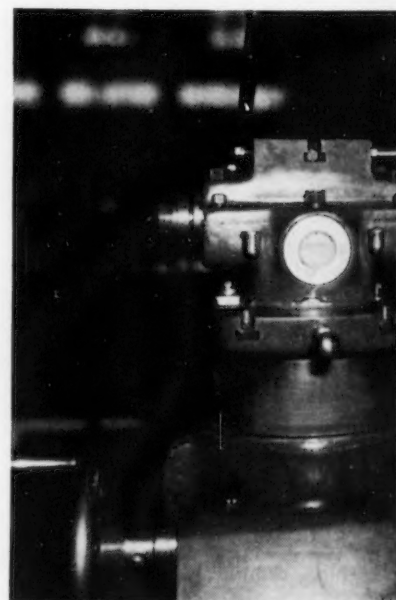
Accurate grinding is essential. Practice has indicated that the difference between the highest and lowest teeth for both face and corner, must not exceed 0.0005 in. The lowest tooth should be marked and ground first. If one blade extends considerably beyond the others,

time will be saved by grinding it independently.

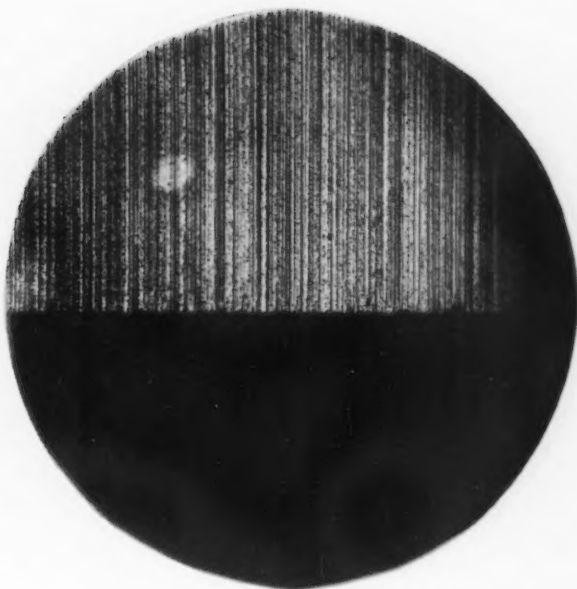
When using an abrasive wheel, the required accuracy is obtained either with an indicator reading to 0.0001 in. or by a special diamond truing device. The sound produced when using a diamond wheel, and the disappearance of the sparks give the best indication that sufficiently true surfaces have been obtained. The finishing diamond wheel should remove only the surface roughness left by the abrasive wheel.

Milling cutters with hard-metal tips should generally be of the inserted-blade type, backed-up rigidly

SPECIAL felt pad mounted on head—
supply correct



CUTTING edge
finish ground
with a fine-grit dia-
mond wheel (100X).



as near as possible to the cutting edge. Cemented-carbide milling cutters for machining aluminum and other light metals should have a small number of teeth.

Breakage of cemented-carbide tips is sometimes caused by wrong methods of fastening them to the blades. A satisfactory practice is to braze the tips on the blades by perforated electrolytic-copper foil, using a temperature of approximately 2100 F. and a muffle furnace to avoid oxidation.

Grinding should always be done against the cutting edge. To provide a sensitive, yet positive, control of the grinding process, feed-

ing the work past the wheel should be done by hand rather than by power, thus permitting the operator to adapt the feed to the depth of cut at all times. A freely moving table, provided by an antifriction support has been found of great value. Not more than 0.0002 in. should be removed per pass.

The tool must be kept constantly in motion to prevent excessive localized heating and consequent damage of the tip. No standard practice regarding the number of stages of grinding employed has yet been adopted. Where wear is heavy, grinding with a roughing and a finishing abrasive wheel, followed by lapping with a 100-grit and a 400-grit diamond wheel, may be necessary. For average wear, practice has shown that the 100-grit diamond wheel with a medium concentration produces a surface that is at least as good as one produced with a 120-grit abrasive wheel. Hence, the finish-grinding operation with the abrasive wheel can often be omitted. The trend in grinding cemented-carbide face-milling cutters now appears to be more and more in the direction of using diamond wheels both for roughing and finishing, due to the reduction in heat developed.

To maintain a satisfactory finish on the surface being milled, cutter wear should not be allowed to proceed too far. Tests on the milling of cast iron have shown that the quality of finish deteriorates rapidly after abrasion of the cutting edge has extended back along the flank between 0.008 and 0.010 in.

Further breakdown of the cutting edge also increases rapidly after abrasion passes this point.

Book Devoted To Gear Design

WORKING rules, formulas and data required by gear designers and shop men are given in a book entitled "Gear Design Simplified," compiled by Franklin D Jones and published by the Industrial Press, 148 Lafayette Street, New York. The book comprises 134 pages, 8½ x 11 in., and some 200 drawings. The price is \$3.00.

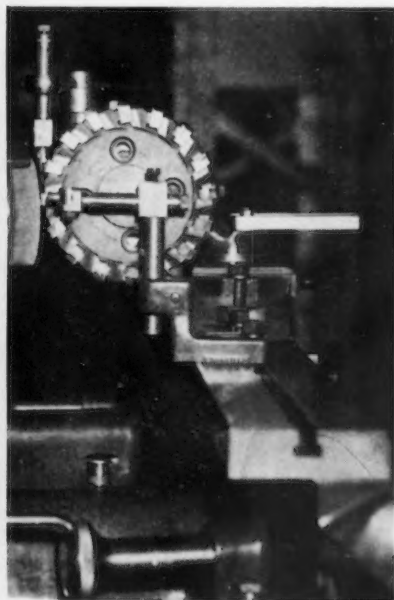
The theoretical side of gear design has been excluded. Types of gears dealt with include spur, internal, bevel, helical, herringbone and worm gears, and a section on the figuring of speeds and ratios covers various transmissions of planetary type. Rules and formulas for determining the power-transmitting capacities of different types of gears are given in another section.

Problems are presented in simple chart form and each is illustrated by a diagram showing the dimension or angle required. Opposite this drawing is the rule and equivalent formula for determining the dimension, angle or other value, and also an example of how the rule or formula is applied. Where the problem has more than one solution, the different solutions are given.

Other material in this gear book includes explanation of the application and advantages of different gear-toothed standards, and tables of tooth parts which cover a wide range of standard pitches and give complete tooth dimensions for any diametral or circular pitch.

Porcelain Enamel Institute, 612 North Michigan Avenue, Chicago, has published "Test for Acid Resistance of Porcelain Enamels," which was prepared under the direction of the institute's committee on test standardization, of which W. N. Harrison of the National Bureau of Standards is chairman. The test, which has been in the course of preparation for the last year or more, is termed as a "tentative standard" and will continue in its present form until it is supplanted by a standard test for acid resistance.

stock of cutter-grinding machine to quantity of coolant.



The Control of Electrically

CHAPTER 13 of a comprehensive series on the **Economics of Industrial Power Transmission**, begun in the issue of Nov. 19, 1937.

o o o

THE equipment for controlling alternating current motors includes manually operated switches and drums, magnetic contactors actuated by relays and various pilot devices, and resistors in various forms. As in the preceding article, these will be described briefly with respect to their functions.

Face Plate Controllers for alternating current motors are made in three types:

1. Starters for single phase commutator or repulsion motors. These are similar to the starters used for direct current motors, and have the same number of resistance steps. They are used to limit the starting current inrush.

2. Starters for multi-phase slip ring motors. These keep down the starting current inrush by inserting a resistance in the secondary circuit of the motor. They may or may not include a knife switch or magnetic contactor for the primary circuit. Slip ring motors, whether for two- or three-phase operation, are usually equipped with three-phase rotors. The starting lever of the controller is, however, arranged to change the resistance in two phases only, with a fixed step in the third phase. The resistance is delta-connected, and balances only in the initial starting position and on the final running position.

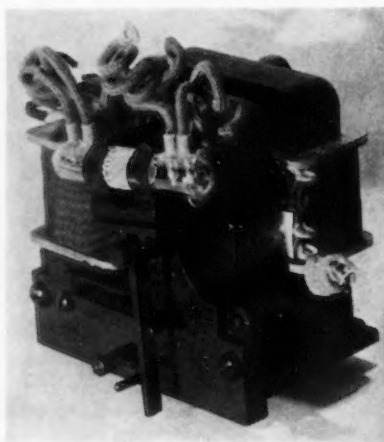
3. Speed regulators for multi-phase slip ring motors. A face plate speed regulator for a slip ring motor must be arranged to commute resistance in three phases simultaneously. This requires a three-arm lever. Since a motor of

the size with which such a regulator is used may safely be started by connecting it directly to the line, it is not necessary to provide any means to insure that the regulator is in the off position when starting the motor. Any type of primary switch or contactor may be used with such a regulator. The resistor is star-connected, and is cut out step by step in all three phases together, although the segments are usually staggered slightly to give a larger number of speed control points.

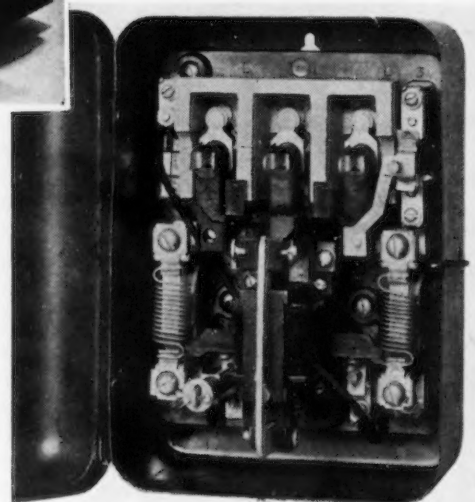
Across-the-Line Starters. Small squirrel cage motors are generally started by connecting them directly to the power supply lines. Such motors are usually protected by

fuses of small enough capacity to guard the motor windings against line surges while running. The starting current, however, is comparatively high, and would cause these fuses to blow. Manual across-the-line starters, therefore, short-circuit these fuses during the starting period, then cut them back into the circuit again when the motor has come up to speed. In another type of starter, instead of fuses being used to protect the motor, time limit overload relays are used, with the time delay feature arranged so that it will not trip on the high current of the starting period. In this case the starter is simply equivalent to a knife switch, as it is not necessary to short-circuit the time delay relay in starting.

For larger squirrel cage motors, across-the-line starting is accomplished with one or more reduced voltage steps. The most usual means of securing a reduced starting voltage is by means of an auto-transformer connected in the power supply line, arranged to deliver about one-half line voltage to the motor at starting, and as the motor comes up to speed, to be short-



ABOVE
IDEAL ELECTRIC & MFG.
CO. slip frequency field
control relay for controlling
the application of energy
to the field windings of a
synchronous motor.



AT RIGHT
G. E. three-pole mag-
netic switch, for
starting squirrel cage mo-
tors across-the-line, or for
use as a wound rotor
motor primary switch. In-
cludes a magnetically
operated contactor and
overload relays.

Driven Machinery

By FRANCIS JURASCHEK
Consulting Editor, *The Iron Age*

circuited so that the motor will continue to operate at full line voltage.

Multiple Switch Controllers for a.c. circuits are substantially the same as those used in d.c. circuits as previously described.

Drum Controllers. There are four principal types of a.c. drum controllers, classified by function as follows:

I. Reversing, across - the - line starting for squirrel cage motors. Drums for this purpose are similar in construction to small d.c. drum controllers.

II. Non - reversing, starting or regulating, for slip ring motors. These drums operate on the same principle as face plate controllers which cut out resistance in the rotor, except that they do not cut out resistance in all three phases simultaneously. Drums for regulating duty have several balanced speed points in addition to the unbalanced points. The primary circuit is not handled by the drum controller, but by an auxiliary knife switch or magnetic contactor. If the latter is used, it may be interlocked with the drum, to give

either low-voltage release, or low-voltage protection as desired, and the primary circuit may not be closed unless the drum is in the "all resistance in" position.

III. Reversing, starting or regulating for slip ring motors. These have the reversing contacts changing the primary circuit of the motor, mounted on the drum. The secondary circuits are similar to those of the non-reversing type.

IV. Reversing or non-reversing, across-the-line starting, for multi-speed squirrel cage motors. To quote Harwood, in "Control of Electric Motors," "Small reversing and

non-reversing drums for multi-speed alternating current motors have come into wide use as the field of the multi-speed motor has expanded. The drum construction is particularly applicable to this service, as it is relatively easy to arrange for the complicated transfer of circuits which is required, and to do this in small space. Multi-speed motors have a wide field of application in connection with machine tools, and it is here that the drum is particularly advantageous because of the small space required. Drums for this purpose are generally built without any frame or cover, the cylinder shaft and finger mountings being supported from the head plate of the drum. The machine is provided with a suitable cavity to house the controller, only the head plate and the operating handle being visible. This keeps the controller out of the operator's way, permits the wiring to be connected inside the machine casting, and in addition greatly improves the appearance of the machine."

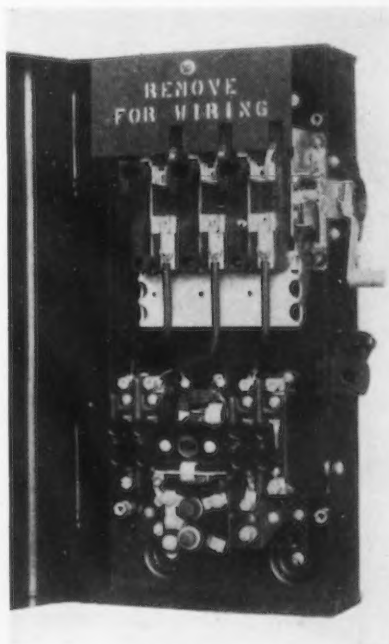
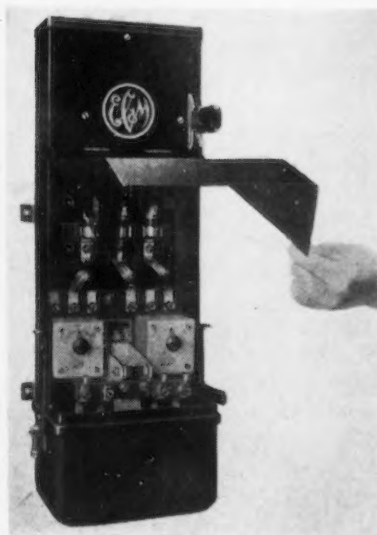
Contactors and Relays

Two important essentials for the control of all but the simplest of electrical circuits are defined by the National Electric Manufacturers Association code as follows:

Magnetic Contactor. A magnetically actuated device for repeatedly establishing or interrupting an electrical power circuit.

Relay. A device which is operated by a variation in the characteristics of one electric circuit to effect the operation of other devices in the same or another electric circuit.

Harwood says, "The electromagnetically operated switch is one of the most useful mechanisms that has ever been devised for closing and opening electrical circuits." Most of the problems of electric motor control finally resolve them-



ABOVE
CUTLER - HAMMER a.c. across-the-line starter for squirrel cage motors, with disconnect switch.

AT LEFT
ELECTRIC CONTROLLER & MFG. CO. push button across-the-line starter for a.c. motors, combining magnetic contactor oil immersed, and thermal overload relays.

selves into one of opening or closing electrical circuits. Since the magnetically operated switch is extremely flexible and versatile in its forms and applications, its use has aided materially in simplifying and making easy all sorts of motor control problems.

Magnetic contactors save time and effort as compared with manual controls in handling large currents or high voltages, or in repeating certain operations many times an hour. They tend to increase the

erated by a shunt coil supplied with energy from a constant-potential circuit. When the coil is energized, the contactor closes a circuit in the main line.

Magnetic Lockout Contactors. These are used for accelerating direct current motors. Two coils are generally used, and the contactor is normally open. For high values of inrush current, the lockout coil will exert a stronger effort to keep the contactor open than the closing coil will exert to close it. When the

does. All these effects may be accomplished easily in the design of the contactors.

Shunt Relays are similar to shunt contactors except that they are required to handle only small amounts of current, since they commute the coils of other relays and contactors, and do not handle motor current directly.

Overload Relays are used to protect a motor against excessively heavy loads. Usually a series coil connected in the motor circuit lifts a plunger when a certain value of current is reached, to trip a set of circuit-opening contactors.

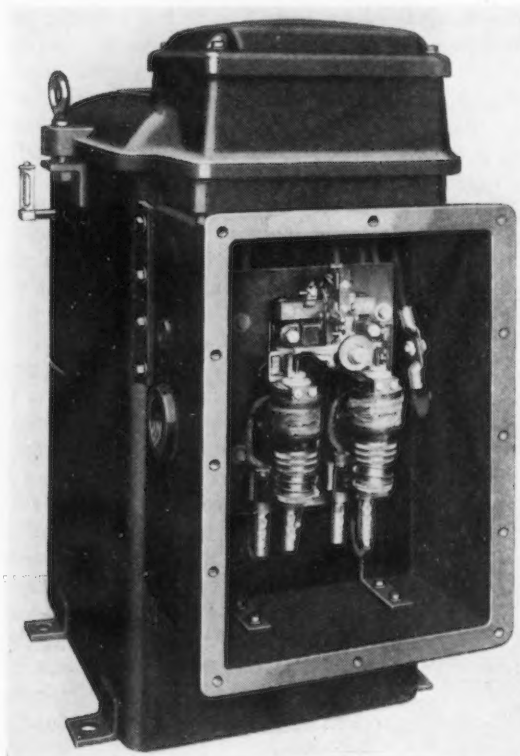
Series Relays are used to control d.c. motor acceleration. With an operating speed which may be 100 times faster than contactors, their use provides safe and rapid automatic control of the armature currents during the acceleration period.

Timing Relays close a number of circuits in sequence within a definite period after the coils have been energized. They may be designed also with all contacts normally closed, and arranged to open in sequence within a definite time period. Such relays are used for inserting successive steps of resistance into the shunt field of a motor to increase its speed.

Field Relays are used for automatic acceleration and deceleration of d.c. motors by varying the field strength. Likewise, on certain types of work where it is not desired to cut off the power completely when a sudden overload condition is encountered, such a device may be used as a "jamming" relay, to insert heavy resistance into the line and thus prevent the current to the motor from reaching an excessive value. The same type of relay can be used to open or close circuits when definite voltages are exceeded.

Motor-driven Timers are sometimes used where the motor acceleration period must be accurately timed over a comparatively long period, and where starting is infrequent. When the starting button is pressed a main contactor closes and starts a small pilot motor on the panel, driving the contactor cylinder through reduction gearing. The speed of rotation of the contact cylinder is designed so that successive circuits will be closed in definite time periods, permitting the main motor to accelerate

(CONTINUED ON PAGE 88)



ELECTRIC CONTROLLER & MFG. CO. explosion proof motor starter, push button control. All main contacts are immersed under a 6 inch head of oil.

safety factor of operation, they save space when many pieces of apparatus are to be controlled, they permit of easy remote control of any motor from a number of different points, they simplify automatic starting and stopping, and may take automatic acceleration completely out of the operator's hands. Automatic control by means of contactors result in a saving in wiring costs if the point of operation is at any distance from the motor and controller, since the contactor circuit is of light wire instead of the heavy cable required for a power circuit.

D. C. Contactors and Relays

The principal types of direct current contactors and relays are:

Shunt Contactors. These are op-

erated by a shunt coil supplied with energy from a constant-potential circuit. When the coil is energized, the contactor closes a circuit in the main line.

Inductive Accelerating Contactors. These are similar to magnetic lockout contactors, but operate to give time delay effects. When current is induced in a motor circuit by circuit interruption, this form of contactor delays the immediate reclosing of the motor circuit until the induced current dies down to a very small value.

Electrical or mechanical interlocks can be arranged between magnetic contactors to (1) make one depend upon the operation or non-operation of another, (2) make two or more contactors operate simultaneously, or (3) insure that one does not close when another

Induction Heating Facilitates Forging and Swaging

TWO new applications of induction heating are now being installed by Ajax Electrothermic Corp., namely, (a) induction heating of tube ends prior to a series of forging operations, and (b) heating an end section of a large steel tube prior to a swaging operation.

In Fig. 1 are shown the individual heater control panel and the coil with two steel tubes inserted. High frequency power at 2000 cycles is applied to the coil and in less than 1 min. 6 in. end sections of the two steel pipes are heated to 2200 deg. F., after which they are forged.

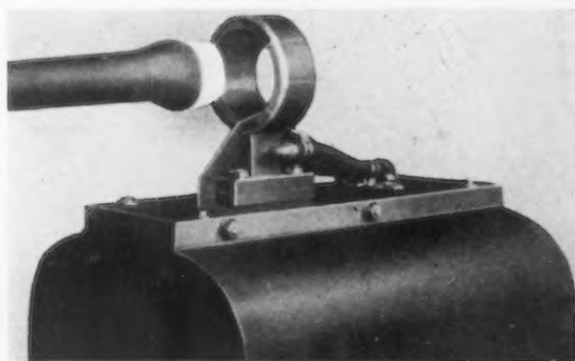
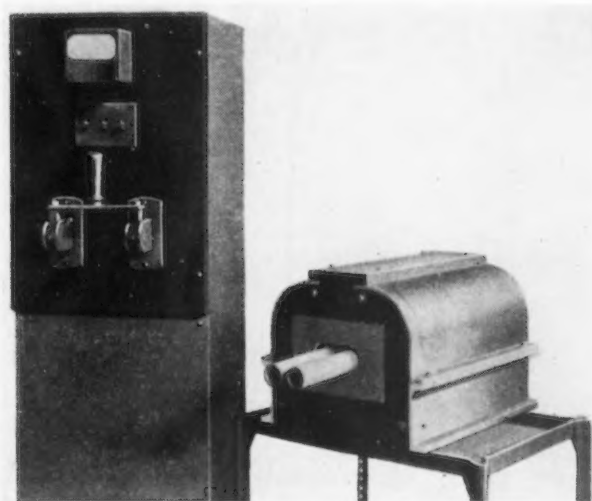
Fig. 2 shows a special focus inductor coil and a narrow band at the end of a tube heated to 2200 deg. F. This is a subsequent operation to that described in the preceding paragraph, and the arrangement permits of a sharply defined heating zone.

In connection with this device, Ajax mentions that it is this same fundamental type of focus inductor coil which is used in the so-called Tocco process for hardening crankshaft bearings by the Ohio Crankshaft Co. This process was developed at Trenton, N. J., and the refinement and automation were carried on by our sole licensee for this process for crankshafts and camshafts (Ohio Crankshaft Co.). The difference in the two applications is that for surface hardening a large amount of power is concentrated for a short time so that the heating is all confined to the surface of the crankshaft and it is then rapidly quenched to produce a very hard surface with a tough core. In the tube end heating application (Fig. 2), the power

is not kept at such a high value—the time is extended to nearly a minute and the walls of the end of the tube are uniform in temperature at 2200 deg. F.

A bar or billet may be heated by using a straight coil energized with high frequency current. It is possible to so heat uniformly throughout the section a 3 in. diameter billet to 2200 deg. F. in 2 min. A 7 in. square billet tested in the Ajax plant came uniformly throughout the section to 2200 deg. F. in 15 min. Temperatures were checked at the surface and center with thermocouples. To heat steel from room temperature to a forging temperature requires about 400 kw-hr. per ton overall.

Fig. 3 shows the kind of a set-up as described in the preceding para-



AT LEFT

FIG. 1—Control panel and coil for heating the ends of two tubes simultaneously by induction.

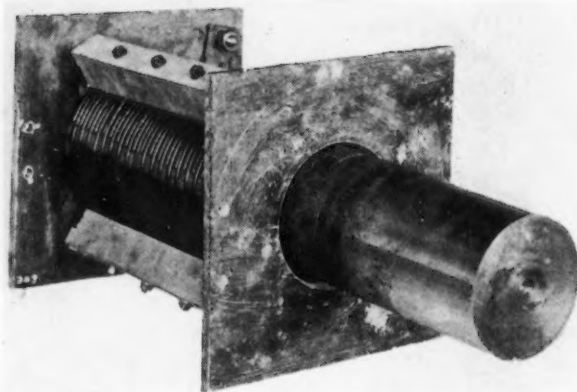
o o o

ABOVE

FIG. 2—Special focus inductor coil for producing a sharply defined heating zone.

graph. The same arrangement applies to the second installation mentioned at the beginning of these notes. Actually the steel piece shown in Fig. 3 is a steel tube closed on the unheated end—running about 5 in. in diameter with $\frac{1}{2}$ in. wall. Uniform temperatures in the wall section required about $1\frac{1}{2}$ min. One other point in this connection, for this job the Ajax company is providing a graded temperature in the heated end of the shell. The open end (inside the coil) is heated to about 2000 deg. F. and gradually tapers back to 1800 deg. F. at the end of the $6\frac{1}{2}$ in. heated section. This is ideal for the forging operation and is easily accomplished by altering the coil turns per in. or the location of the

FIG. 3—A straight coil energized with 2000 cycle current heats the end of this tube (the upper end is closed off), which measures 5 in. in diameter and has a $\frac{1}{2}$ -in. wall.



load in the coil. If, however, the user wanted an end section at uniform temperature throughout with a sharply defined heated zone, this

too can be easily accomplished.

The method lends itself nicely to automatic control and this is being planned for both jobs.

Automatic High-Speed Blanking Press For Wide Coil Stock

THE E. W. Bliss Co., Brooklyn, has improved the design of its No. 4 high-speed automatic blanking press. This press, although single geared, will operate from 30 to 90 strokes per minute through a variable-speed drive so as to permit selection of the best operating conditions for the length

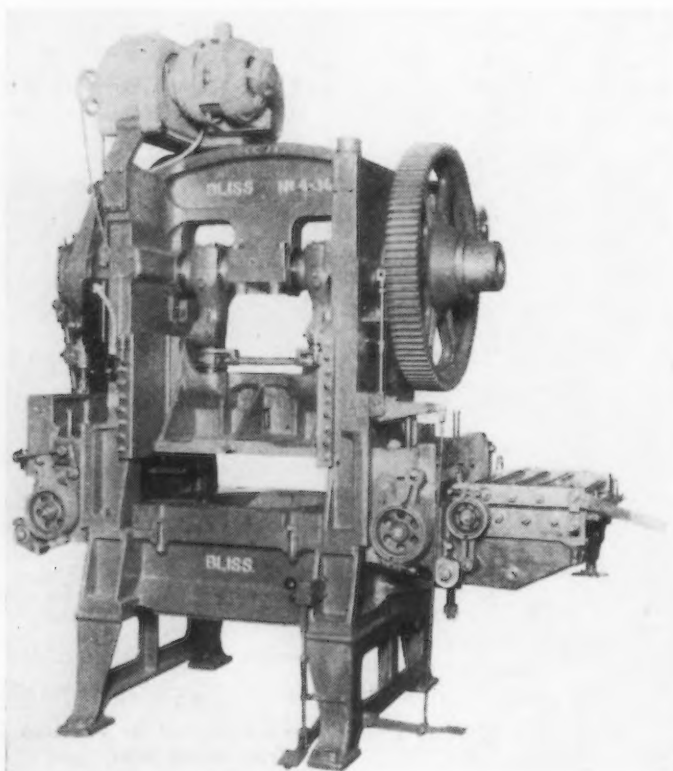
of feed and the gage of metal. A convenient hand chain controls the speed adjustment of the variable-speed drive. A magnetic line starter and push button controls the 5-hp. driving motor, which is connected to the flywheel by means of V-belts. The high-speed rolling key clutch, locking pawl and re-

leasing brake are standard features on this press.

Stroke of $1\frac{1}{2}$ in. and an adjustment of 3 in. has been provided. The shut height bed to slide, stroke down, adjustment up, is $11\frac{1}{2}$ in., while the bolster is 4 in. thick with a 25 in. cored hole in the center. All main and connection bearings are bronze bushed, with the crankshaft running on Timken roller bearings. Slide area is 28 by 31 in., bed area 34 by $35\frac{1}{2}$ in., and a distance of 36 in. between uprights.

A "Bliss" high-speed, double-roll feed, with a seven roll straightener and a shear-type, gibbed scrap cutter are mounted on the press. It is arranged to take coil stock 24 in. wide through openings in the housings. The feed length is adjustable from 0 to 25 in.

This press was originally developed for use in rolling mills to blank out large circular or irregular shaped blanks for the trade, thus eliminating the shipment of scrap. Larger and smaller automatic blanking presses are now available.



Where a "spot" of heat is required within a limited space, a new small cartridge-type heating unit, recently announced by General Electric Co., offers advantages. This new unit is only $\frac{3}{8}$ in. in diameter and is manufactured with brass sheath for maximum operating temperature of 750 deg. F. It is especially convenient for built-in applications and can be quickly installed. Ratings of 30, 75, and 90 watts at 115 or 230 volts, a-c or d-c, are available.

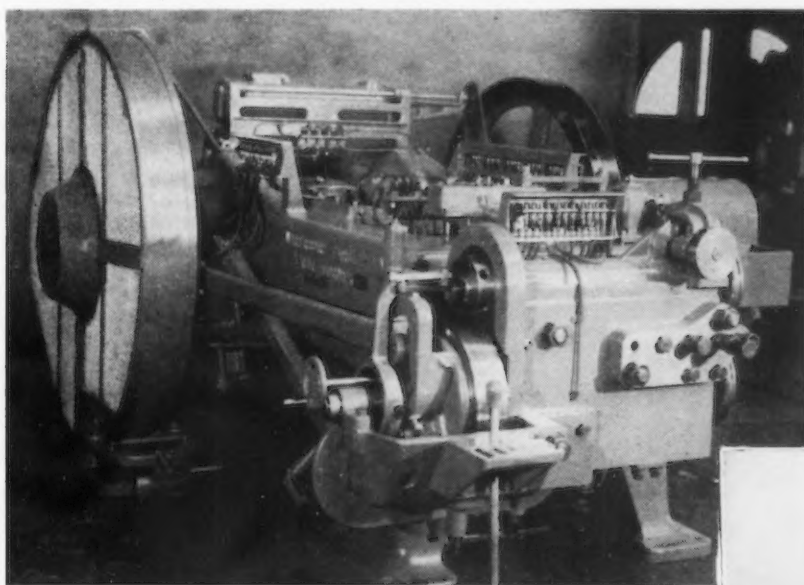
Nut Manufacturing Machines Of New Design

A HIGH-SPEED automatic nut forming machine, and a nut reshearing and chamfering machine, both of new design, have been placed on the market by the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

The nut forming machine, pictured in Fig. 1, is for making double chamfered hexagonal nut blanks from cold drawn steel wire. The nuts are forged cold from the coil and the product is said to re-

inclusive. The rough blanks are first cut from a coil of cold rolled steel or brass on a roll feed press equipped with gang tools. By use of proper press equipment and tooling, the amount of scrap produced is said to be much less than formerly.

It is also claimed that by the use of this automatic reshearing and chamfering machine, the rough nut blanks will be squared up and forged on both faces, giving a bet-



quire no subsequent finishing except tapping.

These machines are built in two standard sizes, namely, a $\frac{3}{8}$ -in. unit rated at 100 blanks per min. and a $\frac{1}{2}$ -in. machine rated at 80 blanks per min. They are driven by a direct-gear motor and are furnished with a complete automatic lubricating system. Basically they are multiple-die single-stroke headers with automatic roll feed, cut-off and knock-out mechanisms, supplemented by a transfer device for carrying the blanks from station to station. The five operations required to make the nut blanks are performed with a single stroke of the gate. Advantages claimed for these machines include high production; homogeneous grain structure throughout; lower cost due to small percentage of scrap, and a complete product requiring no subsequent finishing.

Fig. 2 shows the nut reshearing and chamfering machine, which is used in the manufacture of the smaller sizes of hexagonal machine-screw nuts, from No. 0 to $\frac{1}{4}$ in.,

ABOVE
FIG. 1—Nut forming machine for making double chamfered hexagonal nut blanks complete in one stroke. No subsequent finishing, except tapping, is required.

AT RIGHT
FIG. 2—Nut blank reshearing and chamfering machine for making small hexagonal machine-screw nut blanks.

ter product and a higher rate of production. The machine will make double chamfered blanks, or chamfered on one face only with either a washer face, flat face or special face on the other side, depending on the tooling.

Double hopper feeds and chutes arranged to work alternately and deliver the blanks to the tools at the rate of 200 per min. are provided. The lower ends of the

chutes are hinged and swing toward the center of the machine to carry the blanks into line with the central trimming die. There is a chamfering punch in the gate at each side of the trimming die, as well as two chamfering dies carried in a cross-slide. By this arrangement, one blank is being trimmed while another is being chamfered at the right and a third feeding from the left-hand chute. On the next stroke, the chamfering and feeding are reversed.

The machine will handle a maximum blank $\frac{3}{16}$ -in. thick and $\frac{7}{16}$ -in. across flats. Different chutes and tools must be used for each size of nut.

Dissolving Machine For Solvents

A DISSOLVER for cutting nitrocellulose, dissolving cellulose acetate and natural and synthetic resins of all kinds, and for use in the dispersion of pigments in nitro-cotton and synthetic solutions and for general dissolving of all kinds, has been brought out by the Patterson Foundry & Machine Co., East Liverpool, Ohio. This machine is built for handling materials in the entire range from high



to low viscosity. Dangers from explosion, it is stated, have been eliminated and there is no loss of solvent during the dissolving operation.

The dissolver is built in both plain and jacketed types and also for internal working pressures up to 100 lb. per sq. in. It is obtainable in plain or stainless steel, aluminum and other metals and is built in a wide range of sizes.

Eight-Spindle Vertical Lathe Has Hydraulic Operating Cycle

THE 8-spindle vertical lathe, manufactured by the Sundstrand Machine Tool Co., 2531 11th Street, Rockford, Ill., is designed for rough turning and crowning cast-iron pistons, but it has many other applications.

Machine has a heavy cylindrical base on which an octagonal column

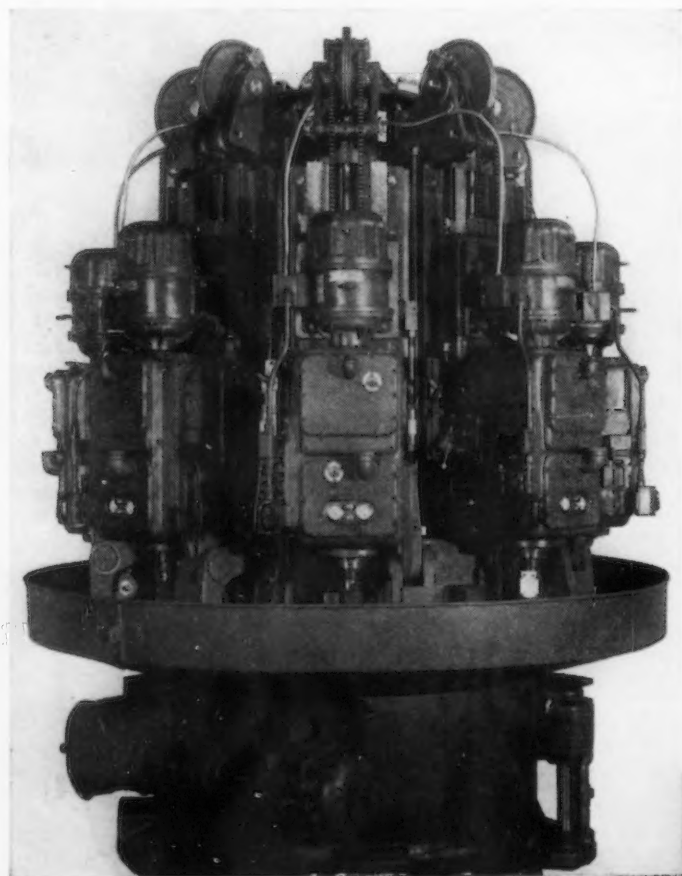
of rapid approach, feed, and quick return, governed by adjustable dogs. On the spindle of each hydraulic unit is a hydraulically-operated expanding chuck for holding the workpiece. The chuck is controlled by push button.

At the lower end of each sub-base on which the hydraulic unit

slides is mounted a stationary tool block, as indicated at *A* in the detail view, for turning the outside diameter of the piston. Pivoted on the side of each hydraulic unit is a heavy bell crank *B* having its inner end connected to a stationary adjustable rod *C*. As the hydraulic unit moves downward, this bell crank swings about its pivot and tool *D*, carried on an arm of the bell crank, turns the dome head of the piston.

At the right of the operator's position is a four-button station for starting and stopping the column rotating motor and also the eight motors which drive the hydraulic units. In normal operation, rotation of the central column is continuous. As a hydraulic unit approaches the operator, he presses one of the buttons in control box *E*. This causes the chuck to release the finished work-piece. The operator then substitutes a rough casting and presses the second button which causes the chuck to expand. As the central column continues to rotate it passes a limit switch which starts the automatic operating cycle of the hydraulic unit on which the work-piece has just been changed. As rotation of the column continues, the hydraulic unit feeds downward, turns and crowns the work-piece, and automatically returns to its upper position. In the meantime, the work-pieces on the other seven hydraulic units have been changed successively as each one has passed before the operator.

Tungsten-carbide cutting tools are used throughout and provision

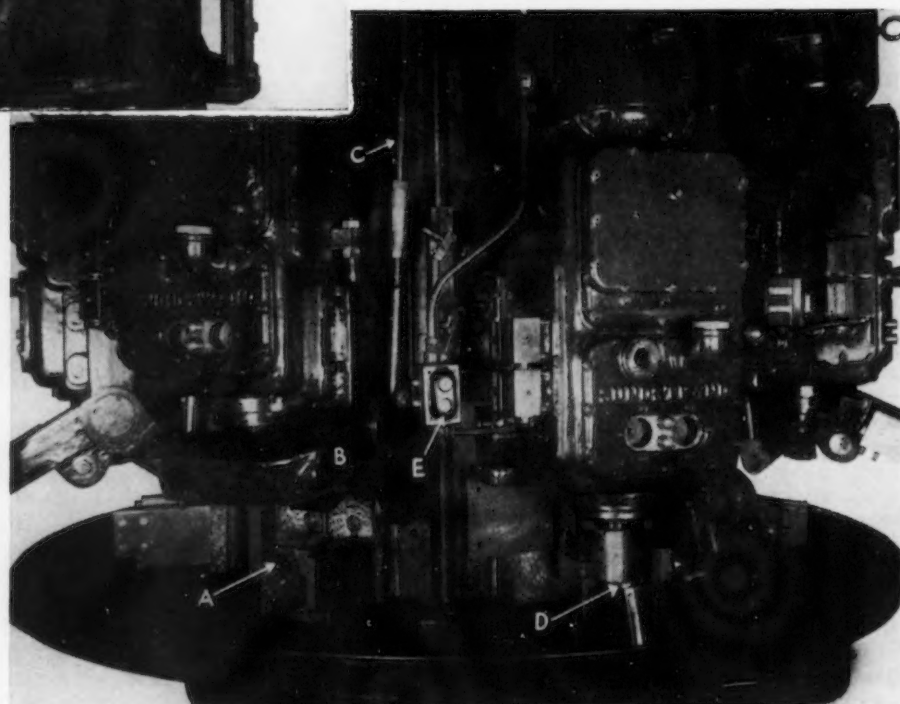


ABOVE
DESIGNED for turning pistons, this multiple automatic lathe has wide application for chucking operations.

AT RIGHT
TOOL *D* on bell crank *A* turns the piston crown as the head descends.

o o o

is rotatably mounted, and driven by motor through a speed reducer and pick-off gear box. On each face of the octagonal column is bolted a sub-base having ways on which a Sundstrand self-contained hydraulic unit travels vertically in an automatic cycle



is made for a copious supply of strained coolant. The hydraulic units, including their pumps and control valves, are standard products manufactured by Sundstrand. The units are self-contained and operate independently of each other.

The particular pistons machined measure $3\frac{1}{2}$ in. in diameter by $4\frac{1}{4}$ in. long and are turned at the rate of slightly more than 400 per hr. at 85 per cent efficiency.

Wrist Chronographs For Industrial Use

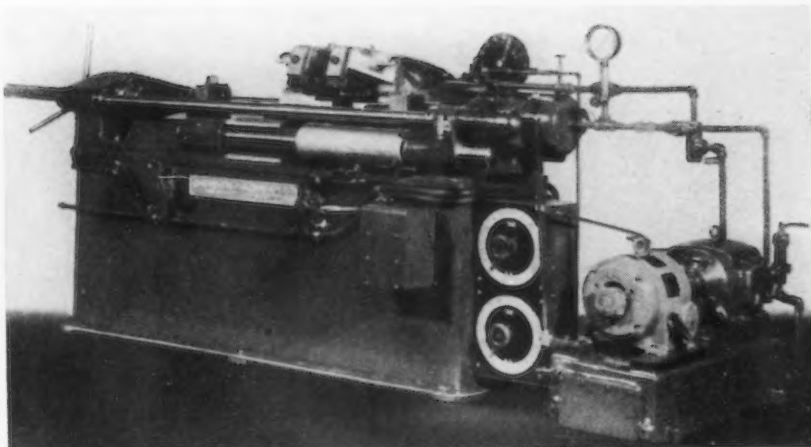
CHRONOGRAPH wrist timers are now available embodying a timepiece of 15 jewels, recording time of day and in addition, the chronographic features of a sweep hand registering in seconds and fifth seconds, or if desired, in decimals of a minute. Another model, here illustrated, has computations on the dial which may be used for ascertaining production per hour, miles per hour or in fact the timing of any single operation is expressed in terms of hourly capacity or speed.

Cases are of Firth stainless steel and all movements are equipped with first quality "Nivarox" hair



springs and "Glacidur" metal balances making them non-magnetic and minimizing expansion and contraction. The double lugs on either side of the crown allow for "take-out-time" for interrupted observations and again proceeding without making it necessary to return the hand to zero. When the sweep hand is in motion, the zero throw-back lug is automatically locked, thereby preventing accidental return to zero.

This line is being introduced by M. J. Stillman Co., Inc., 116 South Michigan Avenue, Chicago.



Precision Machine Designed for Welding Tool Shanks

THE F 29 precision flash welder made by the Thomas-Gibb Electric Welding Co., Lynn, Mass., is built with accuracy comparable to most toolroom machine tools. All parts are accurately finished and the problems of stiffening and reinforcing have been solved in such a way that all parts under stress are of ample size to prevent deflection that might mar the accuracy within which articles such as drills, reamers, and similar tools must be welded.

To prevent deflection, the work back-up stops are mounted directly on top of the frame, instead of overhanging one end. In addition, the back-up stops are toed down at the end next to the work, as well as being attached to the frame at their outer ends. This design prevents the stops from lifting or deflecting. Deflection is further prevented by having the work stops and the tie rods which strengthen the frame all in on plane with the center of welding pressure. This is another feature not incorporated in earlier models. In this way, the work comes out of the machine practically straight and requires a minimum of finishing.

The vertical open-end clamps are air-operated and are an integral part of the machine platens. Both front jaws are provided with horizontal adjustments and both upper jaws are of bronze alloy for efficient heat distribution. The back-up stops are also fully adjustable. Standard die dimensions are $2\frac{1}{2} \times 6 \times 4\frac{1}{2}$ in.

Push-up is by means of a hydraulic pressure cylinder, powered with a pump driven by a 5-hp. motor. Control of pump is by means of a single lever of unusual

length so that starting, stopping or reversing can accurately be controlled. In conjunction with it is a platen-travel indicator with a multiplication factor of 18.

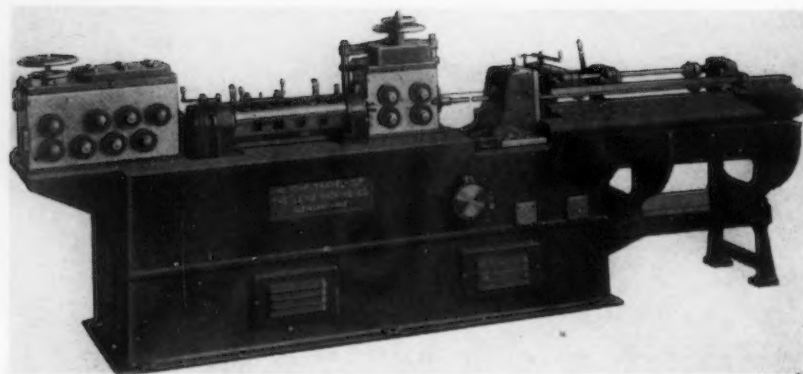
Standard equipment includes the 300-kva. transformer wound for 220, 440 or 550 volts, 60-cycle current. Voltage regulation is by means of taps with eight points for welding and eight points for annealing. Transformer, platens, upper jaws and dies are all water cooled.

Micrometer Attachment For End Rods

A MICROMETER attachment reading in thousandths of an inch is offered by the Brown & Sharpe Mfg. Co., Providence, for use in connection with end measuring rods, thus converting the rod from a gage to an inside micrometer with a range limited only by the number of end measuring rods available.

The micrometer head has a movement of $\frac{1}{2}$ in. Together with the $\frac{1}{2}$ -in. spacer plug, this provides measurements in thousandths of an inch from $1\frac{1}{2}$ in. to $2\frac{1}{2}$ in. longer than the end measuring rod used. This attachment known as No. 280 fits all lengths of end measuring rods $\frac{3}{8}$ in. in diameter. The illustration shows the thimble, barrel and body attachment and spacer plug which is spherical on the inner end.





Automatic Wire Straightening And Cutting Machine

THE No. 10-F "Travel-Cut" is a modern flying shear automatic wire straightening and cutting machine, made by The Lewis Machine Co., Cleveland. It feeds the wire from the coil, straightens, gages to accurate length and cuts on the fly, a method, said to assure a uniform diameter rod throughout the entire length and produces a rod free of feed roll marks.

The cut-off die is securely fastened in the traveling cut-off head. This head has vertical ways to guide the cut-off knifeholder and moves forward with the wire during the cutting operation. The cutting knife is operated by means of a quick-action cam on the flywheel shaft, similar in design to that used on Lewis standard high-speed cutting machines. With this design, the wire is cut during the central portion of the forward travel of the head. This permits the wire, after mechanically tripping the clutch, to move forward to the positive length gage traveling with the cut-off head. Approximately 45 deg. forward motion of the head drive crank is available for gauging the length before the knife strikes the wire.

The machine is equipped with a roll straightener to remove the coil bow and rough straighten the wire before it enters the rotary straightener arbor or flier. A standard five-die steel rotary straightener is used for the finish straightening operation, and is designed to take hardened iron, bronze, babbitt or any type of straightener dies. It is particularly suited for precision work on bright-finished steel, bronze, aluminum and alloy wire.

This is the first machine of this size to have all main drive units fully enclosed in oil housings, including the flywheel and clutch. All the cut-off drive mechanism is com-

pletely sealed in the machine bed, and the cut-off cam and head drive crank run in oil. Forced feed lubri-

cation is provided to the cut-off head ways in the bed. The cut-off head is provided with sliding covers that completely enclose the ways, and seal the entire head drive and cut-off mechanism from wire scale and dust.

New type extension support brackets are mounted on a rigid steel base extending from the machine base the full length of the extension. The wire brackets are constructed to hold the cut lengths away from the machine so that they can be readily removed without interfering with the operation of the machine. A T-shaped gage rod fits in a T-slot in the guide bar and is thus supported to the very end without the use of removable clips.

All transmission gears are alloy steel, heat-treated and fully enclosed in the transmission housing. Feeds and flywheel speeds best suited to the wire to be straightened and cut are obtained by simply shifting the transmission levers.

Special Drilling and Tapping Unit

TWO of its standard No. 21 automatic drilling units have been mounted on a vertical column for drilling and tapping door knob spindles, in a unit built by the Langelier Mfg. Co., Providence. The unit at the right is equipped with a seven-spindle multiple drill

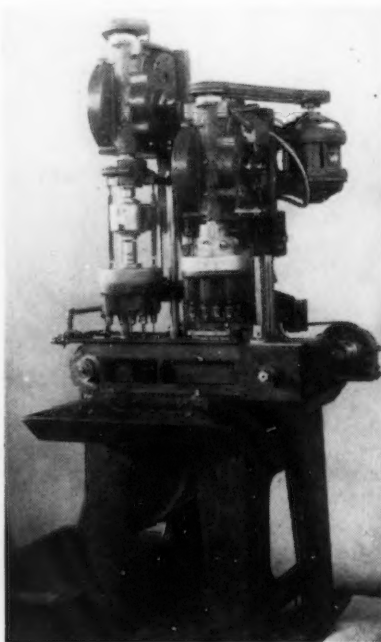
head; and the unit at the left has a seven-spindle multiple tapping head used in connection with a reversing mechanism. After the drill head is started in motion, it operates a trip dog on the tapping head which feeds the taps through the work.

The fixture on this machine is adjustable so that spindles having four, five, six or seven holes can be drilled and tapped. The center distance between holes in various lengths or pieces cannot be varied, however.

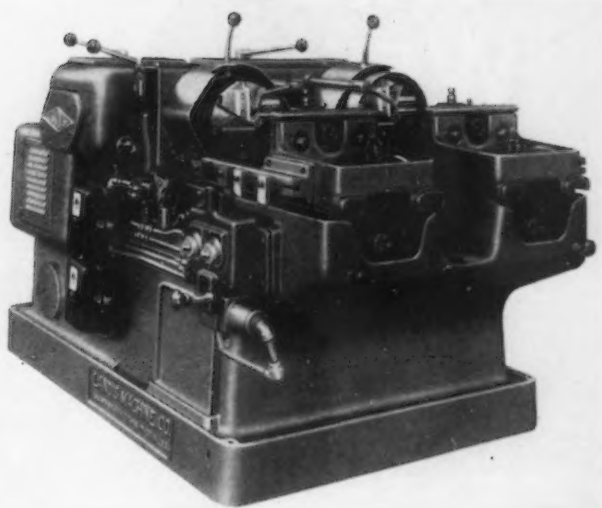
The control of the indexing is through a solenoid-operated single cycle clutch which is controlled from limit switches on the two units. It is so arranged that the indexing will not take place until the heads return to their starting position, thus preventing jamming and breaking of drills and taps.

The work is loaded into a vertical magazine and fed progressively through the drilling and tapping stations. A novel feature of this redesigned machine is the conveyor chain fitted with work locating blocks and the arrangement for disposing of the chips which are washed down through the center of the fixture and out the chute.

Jacobs chucks are used to allow for grinding the drills. The tapping head has compensating spindles so that in the event of drill breakage, the corresponding tapping spindle will simply recede in the head.



By adding a special centering device and substituting milling cutters for threading dies, this hydraulic threading machine has been converted into a lathe for steering gear shafts.



Converts Threading Machine For Turning Operations

BY replacing the threading dies by plain milling cutters in the die head, the Landis Machine Co., Waynesboro, Pa., has converted its standard lead-screw machine into a double-spindle machine for turning operations on steering gear shafts. From the original experimental machine, a standard type has been developed under the name, Lanhydro, signifying that it is hydraulically actuated.

In general, the appearance of the Lanhydro is similar to the Landmaco threading machine and all the tested mechanical features of that unit have been retained. A special centering device for supporting the work during the turning operation has been added. This device consists of a female center backed up by a long spiral spring to keep the pressure against the work constant. The center travels back through the spindle with the advancement of the carriage. By using the traveling center to support the work, concentricity between the head of the shaft and the turned stem is assured.

The hydraulic unit and its control valve are of interest. A rapid feed is provided to carry the work to the turning head. A coarse turning feed is then used throughout the machining operation to a point within 0.008 to 0.010 in. of the shoulder. Where a shoulder must be faced, a very fine finishing feed is used. The length of travel of finishing feed is adjustable.

The carriage advances under a finishing feed to a definite stop. A variable "dwell" time is then provided for the final clean up and to

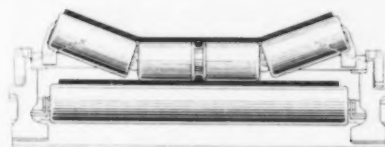
make possible the holding of extremely close limits in length from the end of the shaft to the face of the shoulder. After the dwell period, the turning head opens under hydraulic pressure and the carriage is rapidly returned to complete the cycle. The turning head automatically closes as the carriage returns.

Very close limits are claimed on diametrical size. The head is readily adjusted to any diameter and is equipped with a micrometer graduation for size changes. Due to the fact that four cutters are used, operating in the same plane in relation to the axis of rotation and against the shoulder of the cut, a round, smooth surface is produced. This makes it necessary to leave only a minimum of metal for the grinding operation.

Belt Conveyor For Underground Use

A CENTER-GUIDE belt conveyor developed by Link-Belt Co., Chicago, is suited for use in shallow areas such as in underground work.

The new feature consists of a conveyor belt molded with a continuous central guide strip on the underside, and the use of anti-fric-



tion conveyor idlers having a central roll with a deep groove within which the guide strip is confined in both runs. Operation shows that the belt maintains its central carrying position at all times, even when the conveyor is tilted sidewise at a considerable angle, thus making it unnecessary to use side guide idlers. Center-guide conveyors can be furnished for any width of belt, and with double guides for wider belts.

Connections For Welding Cable

AS a means of increasing the efficiency of electric welding equipment, a line of cable connections and ground clamps is being offered by Tweco Products Co., Wichita, Kan. The "red head" ground clamp illustrated is made of special high copper alloy for high electrical conductivity. It has a capacity up to 500 amp. and a jaw opening of 2½ in. The spring tensioning member is completely insulated. Some of the claims made for this ground clamp are:



Machine settings can be considerably less due to the fact that no current is lost in a poor connection; cable heating is eliminated; electrode holders run cool; and by having a ground connection that is easily portable, arc blow experienced in difficult welding positions may be reduced to a minimum by moving the ground.

Another style of ground connection, known as the Perfection ground clamp has the same capacity and amperes, but the jaw opening is 2¾ in.

Other units in the Tweco line consist of an electrode holder of 400 amp. capacity for both 3/32 to ¾ in. electrodes. The jaw tips, which are replaceable, are made of special wear-resisting copper alloy, and the holder body and trigger are made of fibre insulation. Mechanical cable lugs of both the hole and open type are also supplied. They employ the principle of a tapered screw terminal wedging into a hollow corrugated body so as to give a positive connection and easy field maintenance.

Another unit is the Tweco mechanical cable connector for splicing broken welded cables in the field or in the shop.

THIS WEEK ON THE ASSEMBLY LINE



... Michigan strikes at crest; politicians and union leaders, feeling public pressure, are expected to end labor trouble soon.

o o o

... Republic's Monroe plant goes back to work after spectacular battle between pickets and police.

o o o

... General Motors virtually closed by shortage of parts from foundries and by scattered labor trouble as union makes new demands.

o o o

... Auto financing drops, but sales forge ahead and production is maintained at 118,798 cars for last week.

DETROIT, June 14.—Unless all signs fail the strike situation in Michigan industries is today entering its most critical period. There are strong indications that forces are at work which very soon will bring the issue to a point. Through power strikes which twice have affected more than half a million people and through the rioting at Ford's and the Newton Steel Co. plant at Monroe, public sentiment has been forged. Political pressure now is high enough so that action from Lansing is to be expected. Legislation—good, bad or indifferent—will certainly be forthcoming from the Michigan Legislature. Union

leaders have long since agreed that the strike fever needed some doctoring. With summer and consequent slowing of the automotive industries nearly at hand, strategy calls for at least an easing-up until fall. There are round-table sessions to be scheduled with General Motors. A UAW convention and many caucuses are to be managed before early fall. All in all, it is pretty certain that as soon as present strikes are ended there will be at least a surface quietness for some weeks, even though Ford faces trouble later.

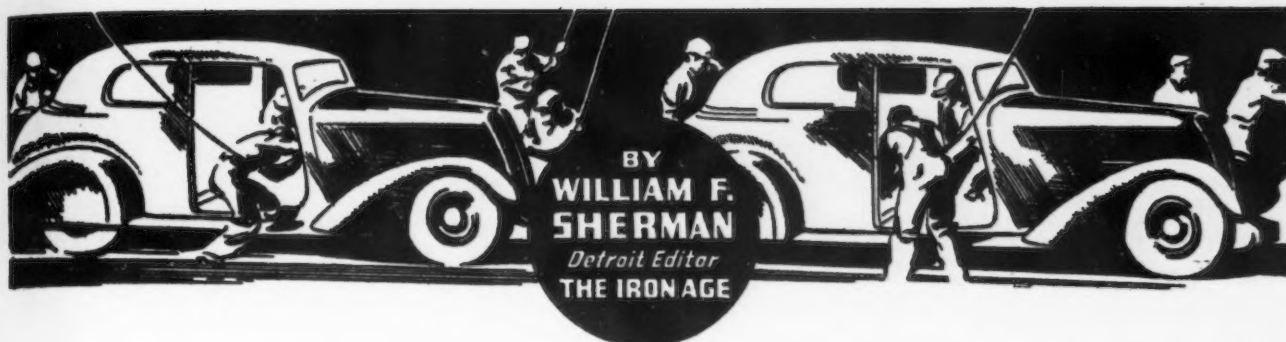
The strike at the Newton Steel Co. plant, Monroe, Mich., is definitely broken and plant schedules

called for operation at 90 per cent of capacity on Monday. Three hundred men went to work on the afternoon shift after the picket line was broken Thursday by 200 special police and 50 city and county officers in a battle with a picket line of 100 men and 12 women. Violence flared only briefly and was limited to relatively few encounters, although more than 1500 spectators were affected by the tear gas that was thrown.

Power Strike Has Repercussions

Much more serious, perhaps, were two strikes earlier last week, one a duplication of the earlier Consumers Power strike in the Saginaw Valley and the other a general labor holiday at Lansing. Both of these, the union said, were wildcat strikes. They probably have served a good purpose because they were serious enough and embarrassing enough to the union and the governor to make repetition improbable. Older labor leaders believe that John L. Lewis is not the type to stand by without doing something after underlings in a far-away city pulled the switches in huge power plants at the instant he was negotiating an agreement with the management. Homer Martin has pledged himself to discipline the instigators.

Evident reluctance accompanied the local unions' acceptance of the terms reached in Washington by their own negotiating committee, however. The Flint vote was 88 to 27 for the terms Lewis presented. At the key substation of Milwaukee, serving the Saginaw area, employees did not ratify the agreement until hours later. Bay City strikers did not actually ratify



the agreement at once, but did return to work. About 1400 power workers will now go on a 40-hr. week with wages increased 5c. an hour, a week's vacation with pay, sick leave benefits and recognition for the union.

The Lansing strike on Monday consisted of a general labor holiday, the cost of which was estimated at \$500,000. It served chiefly to focus attention of the public, the Governor and CIO chiefs on the fact that capricious leadership had gone much too far.

Industrially, the actual state of affairs is best illustrated by General Motors, where more than 21,000 Flint, Saginaw, Pontiac and Detroit employees have been forced into idleness by minor strikes and shortage of parts. Sit-downs in the Chevrolet foundries at Saginaw have occurred several times and, in combination with the power strikes in the Valley, have been steadily decreasing the bank of parts available for machining and assembly. A brief sit-down in the gray iron foundry Thursday forced the almost immediate closing of two Chevrolet parts plants in Saginaw and forced 14,000 Flint workers into idleness over the weekend, with the reopening date indefinite. Ternstedt Mfg. Co., division of G. M., in Detroit, is still strike-bound, with 10,000 employees out. On the eleventh of the month, the UAW asked revision of its G. M. agreement.

Sit-Down Among Office Help

A new phase of labor activity has shown its head at the Nash-Kelvinator plant, where factory workers and about half the office workers are on a sit-down to force an

agreement between the management and the office help. According to the Mechanics' Educational Society of America, led by Matthew Smith, general secretary, 400 of the 3000 employees sat down on the afternoon shift last Thursday. Their demand was for a 25 per cent pay increase for 500 office workers, but Smith said that in pre-strike negotiations, the office workers had volunteered to settle for a 5 per cent raise. Best indications are that less than 300 of the 500 in the office have joined the union and to all appearances the strike may be prolonged while more of the office people sign up. Negotiations were at a standstill.

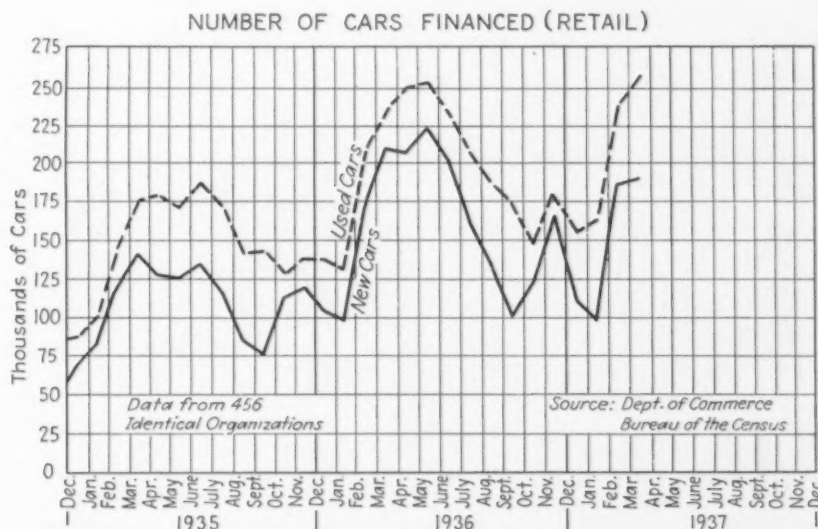
One thousand Packard tool and die makers and 1500 others thrown out of work by the tool and die strike were to go back to work at Packard's today. Hiring-in wage scales as high as \$1.30 an hour were

agreed upon for the tool and die men, the UAW claiming that the new rates meant increases of 3 to 27c. an hour.

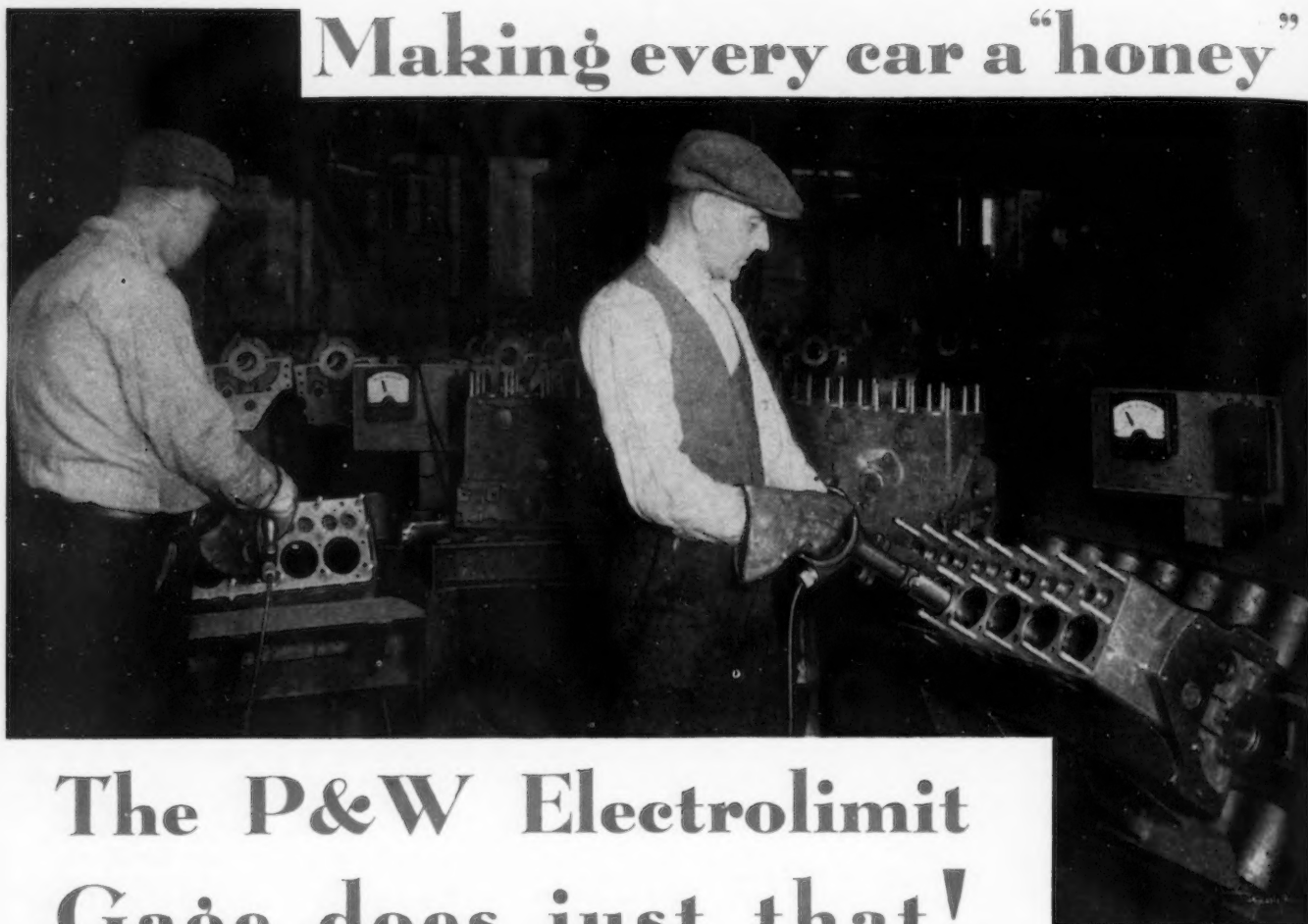
Offices opened recently near the Ford plant by the Society of Tool and Die Craftsmen, an independent, have been closed, a pretty definite indication that this group, at least, made no headway at the Rouge.

Asks for Labor Representative On Commerce Board

Of interest to all in the present state of affairs is the action of J. L. McInerney, president of the McInerney Spring & Wire Co., Grand Rapids, who has just resigned as a director of the Association of Commerce and requested that a "bonafide labor man" be appointed to the vacancy. He suggested the names of five labor leaders for consideration, after Dale Souter, another director, had expressed the



Making every car a "honey" "



The P&W Electrolimit Gage does just that!

Have you ever owned a car that refused to equal the performance of a friend's car just like it? Such "lemons" used to be expected every so often. Now they are rare.



A "lemon" used to grow on the assembly line (under the old system of checking) when parts were assembled just as they happened to come along. Put a low limit piston in a full diameter cylinder and no rings were good enough to hold compression or stop oil pumping. And similar poor fits were happening all over the car.

The P&W Electrolimit Gage has stopped all that. It inspects and *selects* parts into accurate groups which will assemble with precision. Every car is a "honey"—

capable of topnotch performance because it is precision-built thruout.

Our illustration shows only one of many adaptations of the P&W Electrolimit Gage in automotive inspection. The operator is exploring cylinder bores, proving their correct size and roundness, and marking each so that the proper sized piston will be assembled in it. The result is almost perfect mechanical performance.

There are many types of Electrolimit Gages—all basically the same—but each adapted for a particular inspection job. Find out how this modern inspection tool will improve your product. We have literature to send to any interested executive. Write for it today.



PRATT & WHITNEY

DIVISION NILES-BEMENT-POND CO.

HARTFORD, CONN.

opinion publicly that labor ought to have representation. Unconfirmed, there is the general assumption that these two believe that a "look-in" for some labor leaders might alter labor's viewpoint a little.

The Detroit scrap yards, which have been faced with a sultry-looking labor situation, will probably avoid further strikes through an agreement to be announced soon.

Retail Car Financing Off

Retail financing of new cars this spring has fallen off sharply. The break came a month earlier than the first break apparent in 1936 and the total number of cars at the apparent peak for this year is considerably below that of a year ago (see accompanying chart). An accurate explanation of this change in trend is difficult to get because of the variable factors that affect this barometer. It has been learned, for instance, that certain geographical sections of the country do much more time payment buying than others and within these geographical limits (for instance, California, the Midwest farming section or Eastern industrial sections) localized factors such as business conditions or the weather may cause bankers' charts to look erratic. While 1937 to date is far ahead of 1936 as regards sales, the improvement has been largely in the more expensive cars where financing is not so general as in the lower priced cars. Also it happens that some of the class car builders have had less production delay due to strikes, consequently their sales have not been hampered. For example, compare April's low financing volume with its registration figures. Actual registrations in 47 states show gains for Chrysler and DeSoto, but severe losses for

Dodge and Plymouth; gains for Buick, Cadillac, LaSalle and Pontiac, but a heavy loss for Chevrolet, which had difficulty making deliveries. Herein lies the apparent explanation of the sudden change in the number of cars being financed. Certainly the same chart, with its steady increase shown for used cars, is an indication that in used cars, where deliveries were not held up by labor trouble, there were people willing to borrow money so they could ride.

Production Climbs

Production did climb some last week despite all the interruptions, reaching 118,798 compared with a revised figure of 104,136 for the previous week and 98,560 for the corresponding period a year ago. Uncertainties attending General Motors major shut-down, outlined above, make an estimate for the present week virtually impossible.

Automotive engineers have not exactly had time on their hands the last few months, just because there were no major design programs. It has given them a lot more time to talk over their minor problems with inventors and suppliers. Results will be shown in refinements in almost every car on the market, as well as in some new front end treatment. As mentioned not so long ago in the Assembly Line, there is some possibility of rubber seat cushions replacing the spring type cushion and backs. Difficulties have been encountered in this application, as is usual in any such attempt at change, but one case of actual application is on auxiliary seats which have frequently been just upholstered boards. Packard has already been supplied with 150 sets of a spongy rubber which is bound together with hogshair, for installation in

the larger cars which use the auxiliary seats.

Another thing to which automotive engineers have at last put some of their attention is trailer hitches. Every automobile engineer in the business can tell why a standard passenger car should not be used to tow a ton or more of summer cottage around the country; manufacturers have not relented in the least as far as recommending cars for trailer towing is concerned, but frames will be drilled for attachment of company-released hitches. Owners will get more satisfaction out of this arrangement and safety men will breathe easier once some of the present home-made hitches are removed from the highways.

Metal Foil Insulation Being Adopted

Metallic insulation, principally against heat but also to a large extent to shut out noise, will undoubtedly make its appearance in several types of automobiles, if present plans are carried through. Some General Motors and Chrysler passenger cars, as well as any number of the panel type commercial cars, are expected to adopt thin foil in the cellular form to replace the present mats on walls and top. In doing this, automobile manufacturers will be following the lead set by bus builders and trailer manufacturers, who have found various metallic insulations lighter and more effective than pads which have been commonly used.

Not especially new, but generally unknown, is the fact that open cars and convertible models frequently lack stiffness. A supplementary frame is used in the Imperial and Royal lines, Chrysler engineers reveal, making the convertibles as rigid as an ordinary closed body.

An adaptation of the steel mill charging machine plays an important role in the heat treating of small truck parts in the Dodge truck plant. Operated by the man in the control seat, this machine picks up heavy trays of parts and places them in heat treating ovens, where they are tempered for hardness and toughness. The steel arm may be seen at the right as it is inserting a tray of parts into the oven.

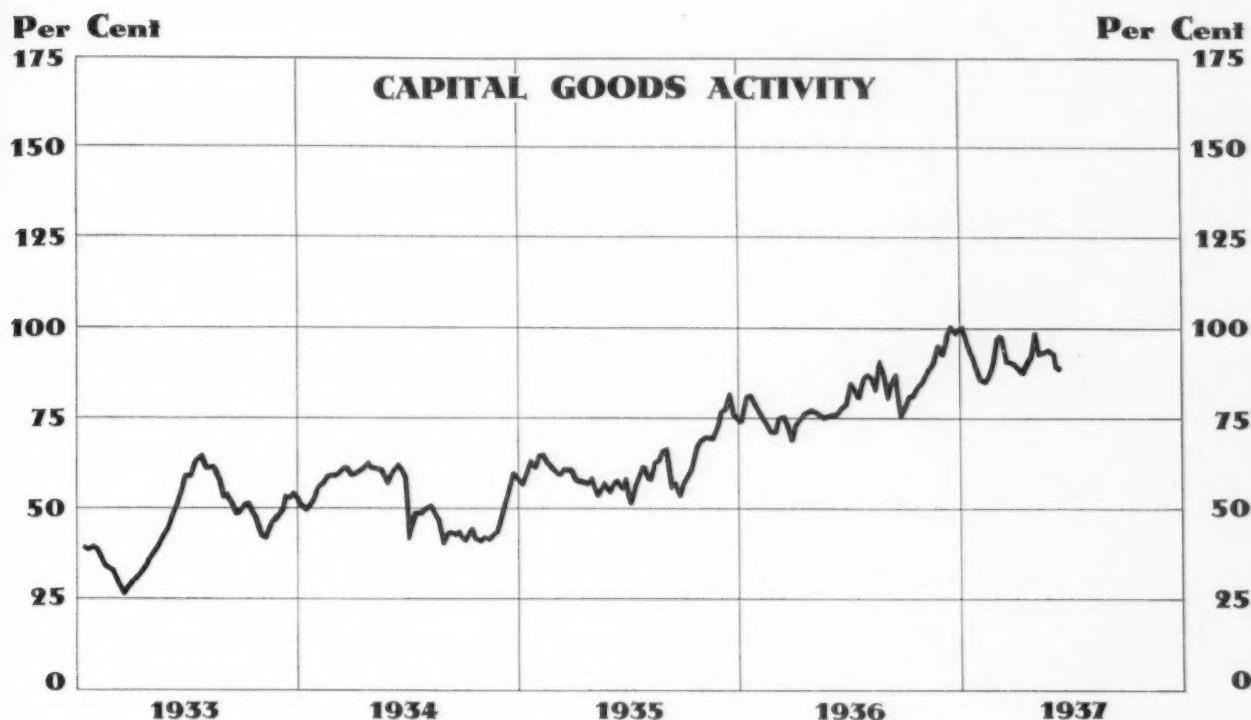


Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week.

	April 1937	March 1937	April 1936	Four Months 1936	Four Months 1937
Raw Materials:					
Lake ore consumption (gross tons)*.....	5,114,177	5,142,496	3,485,293	11,967,034	19,394,291
Coke production (net tons) ^b	4,655,226	4,849,363	3,554,617	13,665,166	18,417,802
Pig Iron:					
Pig iron output—monthly (gross tons)*.....	3,537,231	3,459,473	2,403,683	8,293,585	13,207,422
Pig iron output—daily (gross tons)*.....	114,104	111,596	80,125	144,849	221,551
Castings:					
Malleable castings—production (net tons) ^d	63,377	\$67,559	50,954	185,299	241,869
Malleable castings—orders (net tons) ^d	62,940	\$68,502	47,933	178,071	245,699
Steel castings—production (net tons) ^d.....	.....	.....	63,087	†143,926	.....
Steel castings—orders (net tons) ^d.....	.....	.....	83,188	†182,061	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)*.	5,071,875	\$5,216,666	3,942,254	13,295,237	\$19,427,312
Steel ingot production—weekly average (gross tons) ^e	1,182,255	\$1,117,577	151,625	768,955	\$1,132,788
Steel ingot production—per cent of capacity*.	90.27	\$89.9	69.09	58.7	86.5
Finished steel:					
Trackwork shipments (net tons)*.....	9,888	10,720	7,031	20,771	36,007
Sheet steel sales (net tons) ^f.....	.....	.....	190,269	†564,867	.....
Sheet steel production (net tons) ^f.....	.....	.....	217,975	†622,179	.....
Fabricated shape orders (net tons) ^g	148,152	\$206,321	101,614	482,328	609,989
Fabricated shape shipments (net tons) ^g	136,042	\$142,995	124,044	400,047	481,167
Fabricated plate orders (net tons) ^g	38,769	68,899	29,900	127,027	178,432
U. S. Steel Corp. shipments (tons) ^h	1,343,644	1,414,399	979,907	3,161,188	5,041,685
Ohio River steel shipments (net tons) ⁱ	101,720	122,100	74,110	270,162	408,390
Fabricated Products:					
Automobile production, U. S. and Canada ^k	553,415	518,977	527,726	1,644,622	1,855,724
Construction contracts, 37 Eastern States ^l	\$270,125,200	\$231,245,900	\$234,631,600	\$788,605,400	\$932,455,400
Steel barrel shipments (number) ^d	970,749	995,407	743,291	2,463,863	3,610,184
Steel furniture shipments (dollars) ^d	\$2,462,687	\$2,515,169	\$1,633,633	\$6,290,024	\$9,224,355
Steel boiler orders (sq. ft.) ^d	674,248	1,516,128	783,961	2,807,388	3,696,275
Locomotive orders (number) ^m	84	29	15	88	192
Freight car orders (number) ^m	13,046	6,200	3,650	12,563	40,659
Machine tool index ⁿ	282.5	211.6	125.7	†109.4	†192.4
Foundry equipment index ⁿ	208.1	293.2	134.0	†117.4	†244.8
Foreign Trade:					
Total iron and steel imports (gross tons) ^p	68,197	51,802	49,277	199,844	204,693
Imports of pig iron (gross tons) ^p	11,469	10,720	11,982	65,418	45,963
Imports of all rolled steel (gross tons) ^p	39,239	31,457	23,847	87,059	118,242
Total iron and steel exports (gross tons) ^p	671,746	570,584	301,987	1,016,764	1,735,009
Exports of all rolled steel (gross tons) ^p	197,327	186,531	101,522	339,254	609,521
Exports of finished steel (gross tons) ^p	174,143	173,428	90,116	313,447	555,262
Exports of scrap (gross tons) ^p	421,383	355,979	190,845	645,304	989,443
British Production:					
British pig iron production (gross tons) ^r	680,700	680,300	629,800	2,443,600	2,615,400
British steel ingot production (gross tons) ^r	1,080,400	1,109,500	984,200	3,815,300	4,184,700
Non-ferrous Metals:					
Lead production (net tons) ^s	43,908	43,642	38,073	143,646	168,637
Lead shipments (net tons) ^s	55,200	63,425	40,457	144,876	214,718
Zinc production (net tons) ^s	55,012	\$52,009	\$43,180	163,189	183,052
Zinc shipments (net tons) ^s	56,229	59,635	42,311	166,513	214,044
Deliveries of tin (gross tons) ^v	6,995	9,080	6,235	23,990	31,365

* Preliminary. † Three months' average. ‡ Revised.
Source of figures: * Lake Superior Iron Ore Association; ^b Bureau of Mines; * THE IRON AGE; ^d Bureau of the Census; * American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp.; ⁱ United States Engineer, Pittsburgh; ^k When preliminary from Automobile Manufacturers Association—Final figures from Bureau of Census; ^l F. W. Dodge Corp.; ^m Railway Age; ⁿ National Machine Tool Builders Association; ^o Foundry Equipment Manufacturers Association; ^p Department of Commerce; ^r British Iron and Steel Federation; ^s American Bureau of Metal Statistics; ^t American Zinc Institute, Inc.; ^v New York Commodities Exchange.



The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

Last week	88.0	Same week 1933	51.1
Preceding week	89.0*	Same week 1932	37.6
Same week last month	93.7	Same week 1931	67.4
Same week 1936	76.0	Same week 1930	100.1
Same week 1935	57.5	Same week 1929	127.4
Same week 1934	62.0		

* Revised.

ACTIVITY in the production and distribution of durable goods showed a drop of one point from the revised figure of the preceding week, according to THE IRON AGE seasonally adjusted index. A change in the figure for the week ended June 5 was made as a result of a revision in automotive production, made by the reporting agency. Although production for the week ended June 12 showed a gain of 14 per cent, and heavy engineering construction gained 20 per cent over the preceding week, declines in the Pittsburgh index and in car loadings of lumber products more than offset these gains. Furthermore, on the basis of a 13-week moving average used in the index, the construction gain was nominal. Incidentally, bridge contracts reached

the highest weekly dollar volume recorded this year. The Pittsburgh index is down largely because of a sharp drop in originating shipments (week ended June 5), reflecting the effect of the holiday.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	78.0	+0.5
Automobile production (number of cars and trucks)	118,798	+14,662
Railroad loadings of forest products (number of cars) ..	37,637	-5,038
Pittsburgh industrial production and shipments (index number)	105.2	-4.4
Construction contracts awarded (total value)	\$42,833,000	+\$7,227,000

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.

WASHINGTON



By L. W. MOFFETT

Resident Washington Editor,
The Iron Age

... *Senate investigation authorized to determine whether postal authorities had agreement to bar mail from strike-bound plants.*

... *General probe into steel strikes also to be conducted at same time—Labor Board may not rule on question of signed contracts.*

... *Black-Connery wage-hour legislation will be passed with some revisions acceptable to labor, is Washington opinion.*

... *Representative Crawford of Michigan introduces bill to license all exports of steel, pig iron and scrap for armaments.*

WASHINGTON, June 15.—Direct issue has been drawn and it is to be threshed out by the Senate Committee on Post-offices and Post Roads to determine whether or not Steel Workers Organization Committee strikers had an agreement with postal authorities for the right of inspecting mail before permitting or refusing to permit its passage into the plants of the Republic Steel Corp. in Warren and Niles, Ohio. Postal authorities deny there ever was such an agreement. Two SWOC officials say there was such an agreement.

The Republic Steel Corp., which has threatened court action against Postmaster General James A. Farley unless regular mail is given unrestricted entry into its plants, maintains that such an agreement existed. Senator H. Styles Bridges, Republican of New Hampshire, who originated the demand for investigation of charges of interference with the mails, presented a telegram addressed to him from C. B. Galloway and Walter J. Payne, SWOC officials at Niles, saying they had such an agreement with postal officials. He confronted William W. Howes, First Assistant Postmaster General, with the message after Howes had emphatically denied charges that the agreement had been made.

These grave ceremonies center-

ing around the steel strikes and mail interference took place before the Senate Committee last Friday. Howes and his assistant, Jesse M. Donaldson, were before the committee.

Despite efforts to smother the situation, the entire matter promises to be given a spectacular and wide airing, involving as it does a situation that has few parallels in the history of American postal service. It has clearly aroused Congress as well as the country as a whole, whose pressure brought about a demand for an investigation.

Inquiry Into Both Sides

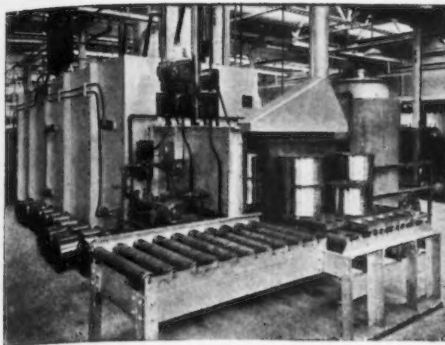
Responding to the demand, the Senate committee, desirous of inviting as little wrath as possible from John L. Lewis' Committee for Industrial Organization, voted to inquire into both sides of the Ohio steel strike situation. But, two-sided though the investigation will be, the fact remains the primary interest rests on the question of mail interference and whether Government proposes to remedy the situation. There were no strings attached to the witnesses who may be called on the charges of mail interference and on counter

charges, instituted by Senator Guffey, Democrat, of Pennsylvania, of possible violation of the Wagner Labor Relations Act by strike-affected steel companies.

The committee gingerly avoided formal action on the Bridges resolution, which called for an inquiry of charges of mail interference or on amendments proposed by Senator Guffey to offset the Bridges charges. Guffey asked for information as to "the moral conduct of both parties" and to "ascertain whether or not the action of the Republic Steel Corp., the Youngstown Sheet & Tube Co., and the Inland Steel Corp. in refusing to sign an agreement (with the union) constitutes a violation of the Wagner Labor Relations Act," etc.

Chairman McKellar, Democrat, of Tennessee, said the committee investigation is to lay a basis on both the Bridges and Guffey proposals. Pleased over the committee action, Senator Josiah W. Bailey, Democrat, of North Carolina, said that "We've got the investigation without the resolution."

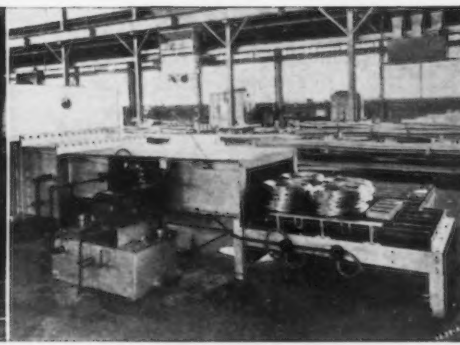
Postal officials, standing fast in denial of agreement for inspection of mails by steel strikers, reiterated that the Postoffice Department



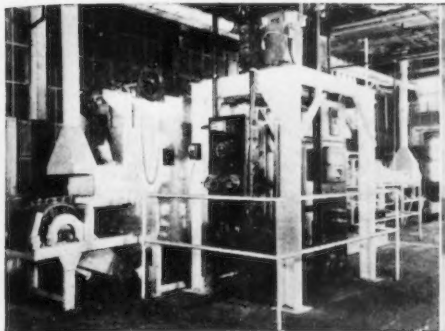
Bright Annealing Wire
—on large reels



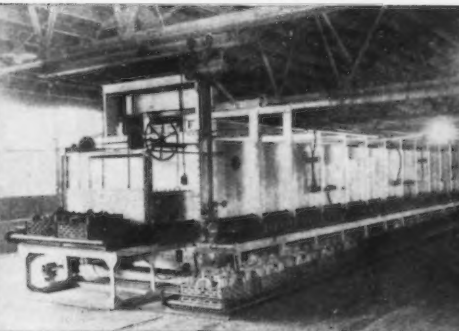
Bright Annealing Wire
—on small spools



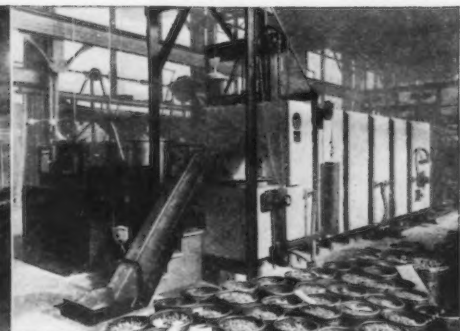
Bright Annealing Wire
—in coils



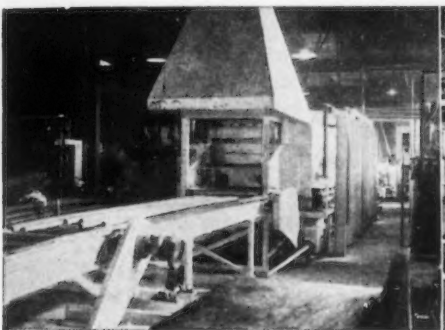
Copper Brazing Steel Assemblies
—economically and continuously



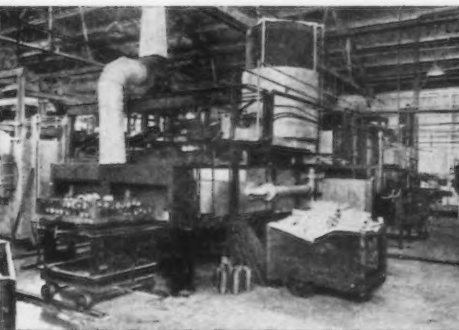
Clean Annealing Short Cycle
Malleable Castings



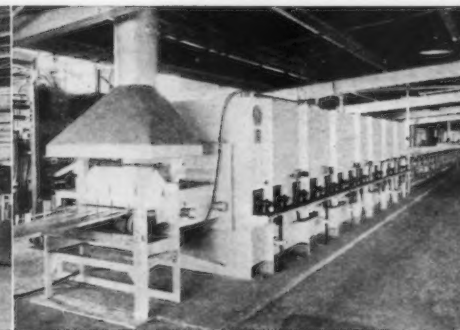
Scale Free Hardening Bolts
—in chain belt furnaces



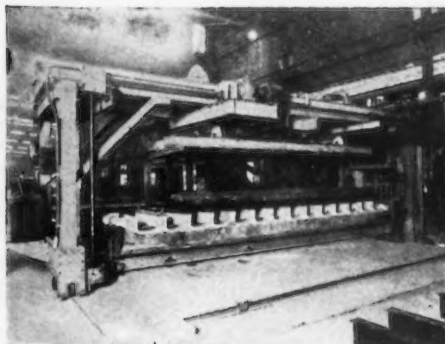
Bright Annealing Tubing
—continuously



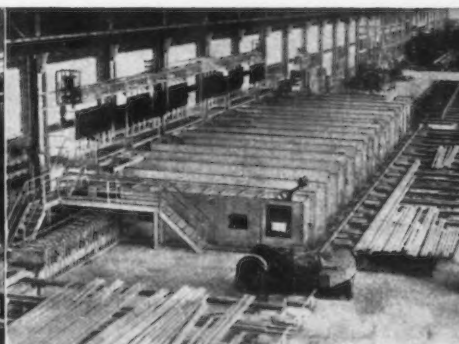
Bright Annealing Stampings
—continuously



Bright Annealing Strip
—continuously



Heat Treating Alloy Steel Bars
—quench in background



Heat Treating 90 foot lengths
—uniformly and continuously



Fuel Fired Billet Heaters
—Built for Oil or Gas

Some Electric and Fuel Fired Furnaces Designed and Built by

The Electric Furnace Co., Salem, Ohio

We Build Gas Fired, Oil Fired and Electric Furnaces—Designed to Fit Your Specific Requirements.

"had no intention of calling on the Government to use force in maintaining deliveries under present unsafe conditions."

CIO Men Admit Understanding

After Howes had denied an agreement permitting mail inspection by strikers, Senator Bridges submitted the Galloway-Payne telegram, dispatched from Niles, which reads as follows:

"We simply had an understanding with the postmaster, assistant postmaster and the postal inspector

of Youngstown, Ohio, as to what kind of packages would pass through the picket lines and what kind would not pass. It was agreed that all regular mail would go through but packages containing clothes and foodstuffs would not, as they were irregular. The action taken during the strike situation was to maintain peace and order and that was what we have accomplished."

This revealing message is expected to play an important part in the investigation. Appearing as wit-

nesses probably will be postal authorities from Youngstown, Warren and Niles, steel officials, CIO officials and citizens who were unable to get delivery on mail addressed to workers in steel plants.

Another "exhibit" presented to the committee by Senator Bridges was a package of mail, opened by the committee, that was marked "undeliverable." It had been returned to Mrs. Hazel E. Finch, Warren, Ohio, who had addressed the package to her husband, a steel worker in the Republic plant in Warren. Other instances of returned "undeliverable" mail were brought to attention of the committee. The package contained a bottle of medicine and freshly laundered undergarments.

Despite the Galloway-Payne telegram, Donaldson said that in a telephone talk with them, the postmaster and assistant postmaster at Niles had positively denied there was an agreement with Galloway and Payne.

"They did talk to them and told them they were going to carry normal mail, not provisions for the company and that they would stand for no interference," said Donaldson.

Howes declared that "The postal service is neither a law-enforcement agency nor a strike-breaker," and that the Postoffice Department is complying with the law in "refusing to risk the lives of our employees by asking them to carry food into these plants." He directed attention to sections 369 and 22 of title 5 of the United States code which authorizes the Postmaster General to suspend mail service under hazardous conditions.

Bridges asked whether he meant "law and order have broken down to such an extent that the post-office is afraid to make deliveries" and Bailey wanted to know if "where violence is threatened, the mails will not be delivered." Howes said the department was unwilling to subject employees to danger and when asked by Bailey if employees could be supplied with "protection," Howes replied that the Postoffice Department is not the police power of the Government and is not going to ask the Government to step in with its military forces.

Republic Offered Protection

Howes read a letter, which he said was from the Republic Steel Corp., in the course of which, Howes said, the corporation offered to supply necessary equipment and even personnel, to aid postal authorities in making deliveries. McKellar showed keen interest in this statement and said the committee



3,000 BLOWS *a Minute* 40 HOURS *Without* REDRESSING

MOIL points used for breaking concrete with pneumatic hammers take a beating.

Shank breakage and the need for frequent redressing are common troubles.

The Jessop Steel Company, co-operating with the Brunner and Lay Company, a Chicago tool maker, was successful in producingmoil points made of Jessop Shock-Proof Steel which stood up for 38 to 40 hours without redressing. Other points often required redressing after four or five hours on the same jobs. Shank breakage was virtually eliminated.

MAKERS OF

*High-Grade
Carbon,
Alloy,
Stainless
and
Composite
Steels*

JESSOP STEEL COMPANY

(OF AMERICA)

GENERAL OFFICE AND WORKS, WASHINGTON, PA.

Branches or Agents in all principal cities

was going to "look particularly into this proposition."

It was insisted by Bailey that conditions justified use of all force at the disposal of the Government and suggested that the Postoffice Department invoke the aid of "the United States marshal, the Department of Justice and the head of the Government."

When the package which had been returned to Mrs. Finch was opened, Bridges asked Donaldson what was "abnormal" about it.

"Well," said Donaldson, "the address calls for delivery over a route where it is unsafe for this particular mail to go through."

A statement from Lewis J. Guernieri, Republic Steel official, was also read by Bridges. Guernieri said he had vainly attempted to mail four packages of non-perishable food to Sam Brown at the Niles plant.

Guernieri quoted Assistant Postmaster Bert Flaherty as saying: "You see, we cannot take these packages because they will not allow it."

Guffey Attacks Steel Companies

In the course of a speech on the floor of the Senate last Thursday, Guffey bitterly attacked the steel companies. He said that "The sole responsibility for the present strike in the steel industry lies at the doors of Republic Steel Corp., Youngstown Sheet & Tube and Inland Steel. All these companies have to do to end this strike immediately is to sign the same kind of a contract that United States Steel and 140 other companies have signed."

Further on, speaking of the three independent steel companies, Guffey stated that they say that under the Wagner law they do not have to sign a contract.

"I say that the obvious intent of the Wagner law, once an agreement has been reached, is to sign such an agreement. It is true that specifically the Wagner law provides for collective bargaining; that is, the company must meet with representatives of its workmen and seek to reach an agreement. It is possible that an agreement cannot be reached in certain situations. Obviously, where there is no agreement there can be no signed contract.

"But in the present instance these steel companies that have brought strikes to the nation's No. 1 industry say they will accept the agreement. They have reached an agreement. But they will not sign."

Answering this attack, Chairman Tom M. Girdler of Republic said that Guffey "not only condones the

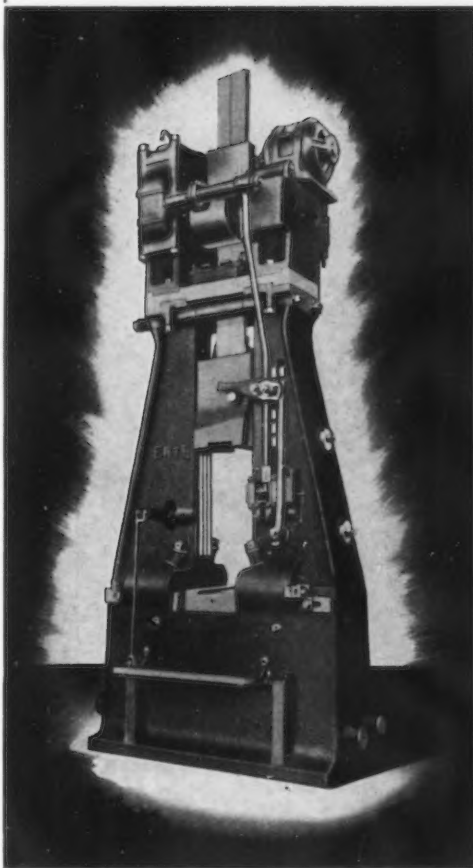
reign of lawlessness now being carried on by the Lewis union in many communities throughout the country, but he brushes aside as of no consequence the many thousands of our employees who are opposed to such a contract."

The Republic executive declared that 23,000 of its workers did not go out on strike and are working today. He pointed out that "many thousands more want to return to work" and that many of the men "are in besieged plants surrounded by mobs of armed and menacing

pickets, most of whom have never worked for Republic."

Members of the American Society of Tool Engineers were the guests of the Firth-Sterling Steel Co. at a dinner held Friday, June 11, at the Penn-McKee Hotel at McKeesport. The speaker was Malcolm F. Judkins of Firth-Sterling, whose subject was a "Description of Production Processes in the Making of Firthite Sintered Carbide Tools." Following this dinner, the members inspected the company's new Firthite-Firthalloy plant.

In The Spotlight



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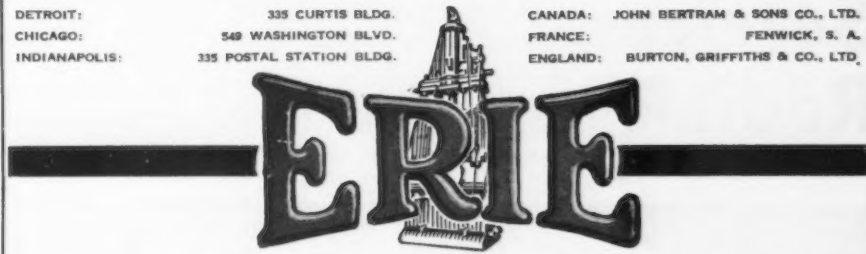
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Bill Would License Exports of Steel, Pig Iron and Scrap for Armaments

WASHINGTON, June 15.—Differing from other measures on that subject, in that it includes pig iron as well as scrap and will place administration in the hands of the Secretary of Commerce rather than the Department of State, Representative Fred L. Crawford, of Michigan, last

Wednesday introduced a bill which would require all export shipments of scrap, iron and steel and pig iron to be licensed. The Secretary would be authorized to prohibit all shipments which he believed would be involved in the manufacture of military equipment. It was not indicated how the Secretary might be

able to determine the purpose for which the scrap and pig iron would be used.

Mr. Crawford pointed out that the bill would require satisfactory information that the shipments will not be used for armament purposes. The measure would give the Secretary access to all communications and contracts existing in connection with any and all shipments for which an export permit would be sought. Violation of the law would be punishable by a fine of not more than \$1000 or by imprisonment of not more than one year.

Mr. Crawford in a statement declared that "an astounding amount of the enormous tonnage of scrap iron being rushed to Europe from the United States is going into implements of war."

Representative Koppelman, of Connecticut, who is co-author of the Schwellenbach-Koppelman scrap licensing bill, conferred with the President last Friday. Following the conference, Mr. Koppelman said he is of the opinion that the door is not closed to the passage of the legislation.

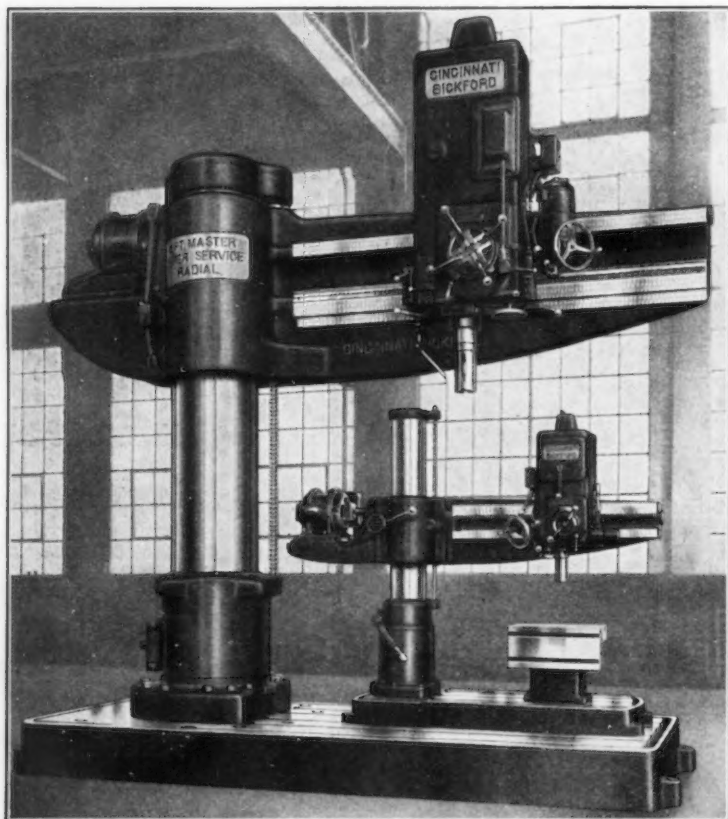
The legislation is opposed by the Inter-departmental Committee, according to a recent letter submitted to the House and Senate Military Affairs Committees by Secretary Hull, who is chairman of the committee.

Navy Awards Large Propeller Contracts

WASHINGTON, June 11.—Secretary of the Navy Swanson yesterday accepted the proposal of the Hooven, Owens, Rentschler Co. of Hamilton, Ohio, and of the Winton Engine Corp., of Cleveland, for furnishing propelling machinery for four submarines to be constructed as part of the replacement program of 1937.

A contract has been awarded to the Hooven, Owens, Rentschler Co. on delivery at the submarine base, New London, Conn., for two sets of propelling machinery for submarines Nos. 194 and 195, using General Electric electrical equipment and Winton auxiliary engines or any other approved type of auxiliary engine satisfactory to the Navy Department, for the sum of \$2,757,888.

A contract has been awarded to the Winton Engine Corp. under its bid on delivery at the Navy Yard, Portsmouth, N. H., for two sets of propelling machinery for submarines Nos. 196 and 197, using General Electric electrical equipment, for the sum of \$2,478,956.



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THE CINCINNATI BICKFORD TOOL CO.
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Washington Believes Wage-Hour Bill Will Pass with Some Revisions

WASHINGTON, June 15.—Despite growing opposition from business and industry, the opinion prevails that the Administration-sponsored and demanded Black-Connery wage-hour bill will be passed at the present session of Congress. Moreover, there is growing doubt that it will be greatly revised except as urged by organized labor. Its voice of opposition to proposed unprecedented powers of the five-man National Labor Standards Board, interestingly enough, offers the principal hope that some of the teeth will be drawn from the bill.

Organized labor, as reflected by both Chairman John L. Lewis, of the Committee for Industrial Organization, and President William Green, of the American Federation of Labor, fears and no doubt with good reason, that if as the bill proposes, the board can fix and vary minimum wages and maximum hours, they will find labor under the Government yoke, regimenting it by hard and fast rules just as it is proposed to regiment industry once more. In such an eventuality, there would be no occasion for unions.

Mr. Lewis and Mr. Green very naturally want to maintain the power of collective bargaining, a reasonable enough desire, provided the power is exercised reasonably. Mr. Lewis, who no doubt has an eye on collective bargaining in the steel industry when existing CIO contracts expire, has been able to get most anything he wants and he wants Congress to take the load off the board and itself fix a maximum work week of 35-hr., of five 7-hr. days, with discretion given to the board to authorize a 40-hr. week in other cases and a basic pay rate of 40c. an hr. Then in the wide undefined area provided, Mr. Lewis would, by collective bargaining, seek to determine higher wages and reduced hours. He does not want the job left to a super-NRA board. In this he finds himself in agreement with growing opposition of business and industry to the bill—growing no doubt because, as the bill is better understood, there is greater appreciation of the vast potentialities of Government control it would give over business and industry.

Basic Industries Not Represented

One remarkable feature about hearings on the bill has been the absence of executives of basic industries, such as steel, metalwork-

ing, automotive and other large employing groups. It may be that they think it unnecessary because they operate with limited exceptions under wage provisions that exceed any requirements that may be made under the legislation and with some exceptions are within any reasonable hour requirement. Or it may be

that at least some of the large industries have left the job to representatives of associations with which they are affiliated. These representatives have made able presentations, yet did not get down to the brass tacks situations that the measure would probably develop in specific industries.

As a generality, it might be said that the legislation would affect most of the basic industries little, if at all. That is, if one naively assumes that this adroitly written bill of ambiguities goes no further



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than its affected worthy objectives. But even if it did not reach beyond this field, it would affect such industries. Take the iron and steel industry. According to the Bureau of Labor Statistics, it has an average entrance wage rate for common labor of 49.1c per hr., which has applied since the recent union agreements were made. In the South the average entrance hourly iron and steel wage rate for common labor is given as 42c. Hence, if a basic minimum rate of 40c an hr. were fixed, the Southern unit of the steel in-

dustry would be most affected. It would be confronted with a lifting of the pay of common labor to a greater extent than would be applicable to other geographical sections of the industry, thus narrowing the southern wage differential pertaining to common labor. The upward revision of common labor wage rates in the industry would be most marked in the case of Negro workers in the South, where, according to a recent report by the Bureau of Labor Statistics, in 1935 they constituted 30.7 per cent of the

wage earners and 60.8 per cent were in unskilled jobs. For the entire iron and steel industry, Negroes constituted about 10 per cent of all its workers with 61.1 per cent in unskilled jobs. Negroes were found to represent 14.2 per cent of all iron and steel workers in the Eastern division; 7 per cent in the Pittsburgh district and 6.5 per cent in the Great Lakes and Middle West district.

The largest proportion of Negro labor was found in blast furnaces, where the work requires less skill than in either steel works or rolling mills. In blast furnaces, 15.6 per cent of the employees were colored as contrasted with 8.7 per cent in steel works and 9.8 per cent in rolling mills. On a district basis the highest percentage of Negro labor in blast furnaces was found in the Southern region, where 37.9 per cent of the total labor force consisted of this class of labor. The next highest class was 26.4 per cent in the eastern region, the relatively large number of such laborers in this region being attributed largely to the fact that a number of the plants covered in the study were located in and around Baltimore, where the Negro is an important factor in the working population. Only 5.8 per cent of all blast furnace workers in the Pittsburgh area were colored. Even before increases were granted, average wage rates for common labor in the iron and steel industry were in excess of 40c in all districts except in the South, with its lower living costs.

Upping of common labor rates, in the estimation of some Southern members of Congress, will mean replacement of Negro labor with white labor, a development that occurred under NRA. Others who share this view say the replacement will be made, not for economic reasons but because of a social phenomenon. Employers have sharply challenged the view. In any case the result, it is contended, will be an accretion of colored people on the Federal relief rolls.

South Might Be Handicapped

If, in the improbable event that organized labor should have its way on the issue and geographical wage differentials were wiped out, the Southern section of the iron and steel industry would face a still further handicap in competing with other sections of the industry. Whether correct or incorrect, it is reported that as a means of assuring passage of the wage-hour bill a tacit agreement with Southern members of Congress has been reached that wage differentials will be maintained. Yet some of the Southern members are disturbed



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over the question, fearing that progress toward building up industries will be retarded if differentials are too wide. The thought is that if the difference is excessive, Southern skilled and semi-skilled labor will migrate to the North. And even any assurance of wage differentials or the extent of such differentials, hardly can be binding if, as proposed, the power to eliminate or reduce them is to rest in a board. This probably explains in part Southern opposition to vesting the board with such broad power as is contemplated. Senator Overton, of Louisiana, has expressed opposition to giving the board such power as the bill provides. Representative Newton Miller, of Louisiana, even more emphatic in opposing such wide delegation of power by Congress, has said the board "will have more power than all the kings and emperors since the dawn of history."

Nine Southern states through their governors are attempting to put the South in a more fortuitous competitive position through a readjustment of freight rates. They have petitioned the Interstate Commerce Commission to compel railroads to lower Southern rates to a parity with those in the official classification territory.

Concerning the power that the wage-hour bill as it now stands would give the board, authority is given the board to fix two rates, as follows:

1. Raise substandard rates to the fixed minimum.
2. Provide for a fair minimum. For instance, where a minimum of 60c an hr. is paid by a majority of employers, the board could state in an order, that as a means of protecting them, the minority must raise their rate to a like figure, but the board could at the same time maintain the Northern-Southern differential. Or, if raising of the rate would unduly restrict employment or unduly restrict earnings of the workers, the board could fix a differential.

Apparently, the recent talk of setting up separate boards for basic industries has been put under blankets, though whether the plan will emerge from the covers either before or after the bill is enacted—if it is enacted—remains to be seen. As the cub reporter on his first big fire told his city editor, all is confusion and anything can happen.

The bill itself authorizes the National Labor Standards Board to set up advisory wage-hour committees for the different industries, the committees to be made up equally of employers and employees, with final determination of agreements subjected to the approval of the

federal board. In this is seen by many a worse labyrinth of complications and bureaucracy than NRA could produce.

As is the situation with respect to many other provisions of the bill, there is a division of opinion as to the proposal to exempt employers of a small number of workers. There are those who think that in principle there should be no exemption but that administratively it is necessary because of the impossibility of policing myriads of small plants, but whose aggregate con-

stitute a large number of workers who will be subjected to sub-standard wages and hours. Still others argue that many of them can be reached, even though they are engaged in intrastate commerce. One means suggested is through state laws prohibiting shipment to states with such laws of goods from another state where wages and hours are below given standards. Another medium is the proposed law itself barring sub-standard practices by intrastate as well as interstate employers.

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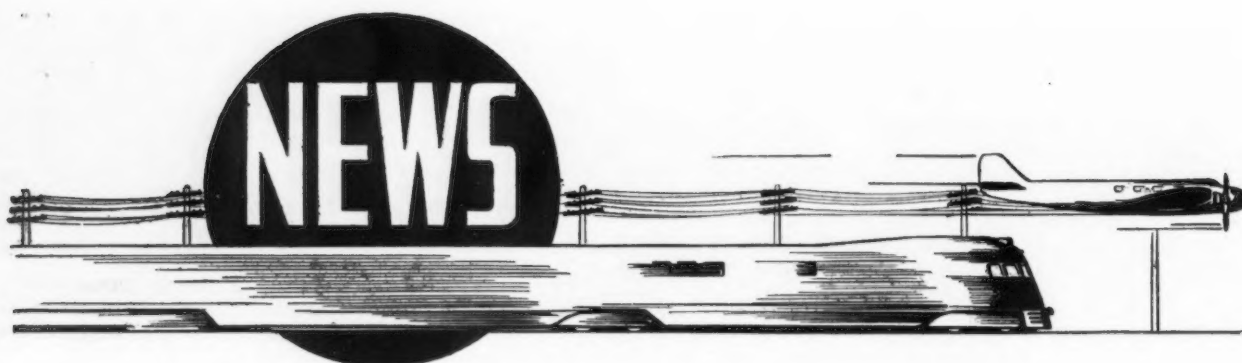
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Washington Commentators Place Blame for Steel Strike Situation on Roosevelt

TWO well known Washington commentators, David Lawrence, whose syndicated articles appear in many newspapers, and Arthur Krock, chief of the Washington bureau of the New York Times, place responsibility for the steel strike situation directly at the door of the Roosevelt Administration. Says David Lawrence:

"Responsibility for the state of violence and reign of terror which prevails in the Middle West today as a consequence of incessant labor warfare rests squarely upon the Roosevelt Administration.

"President Roosevelt, by his alliance with the C. I. O., largest of the campaign contributors, and by his influence with the State governments, has set out to encourage the unionization of labor irrespective of the desires of individual workmen.

"There is no question here any more that the entire Federal machinery has been placed at the disposal of the C. I. O. and that every Government agency is hesi-

tant to take any action which might offend the C. I. O., even though this might be at the same time a denial of justice to other groups of citizens.

"The age-old right to work, which has remained a fundamental liberty of the citizen from the very beginning of the republic, now has been set aside by the assumption of an unlimited right on the part of other workmen not only to strike, but to use any means they choose in preventing fellow workmen from continuing in employment. . . .

"For if the right to work has been permanently abolished and no protection is to be given workmen who refuse to join a union they do not want, then the true labor situation is far different than has been supposed and the country is in for some labor strife bordering on civil war."

President Withholds Comment

Arthur Krock says:

"There being no lack of opportunity for the President to utter

some general comment on labor lawlessness, his continued silence is accepted in Washington as a studied policy. This is disturbing many of his staunchest supporters in Congress. They feel, in view of some of the actions of strikers, that he, who has so often and effectively used off-hand comment to improve specific situations, should employ his prestige to correct any impression that the Government is wholly on one side of the controversy.

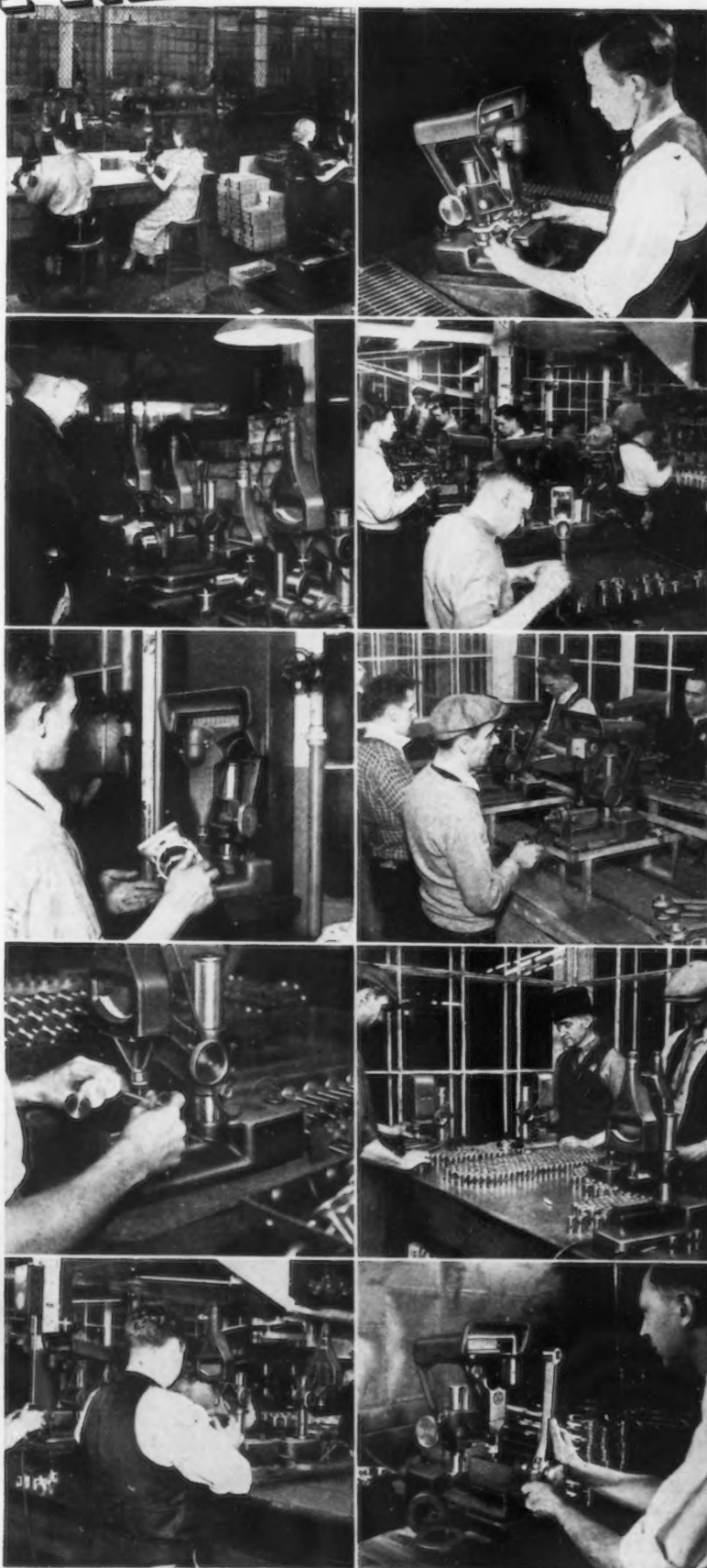
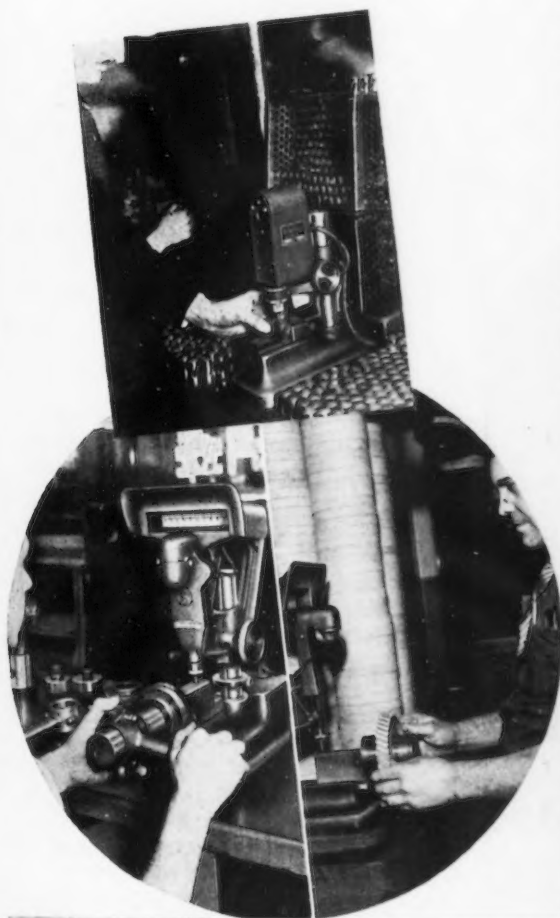
"An unusually good vehicle for Presidential *dicta* is the White House press conference which is held twice a week, Tuesday afternoons and Friday mornings. Ever since labor troubles became acute this year questions about them have been addressed to Mr. Roosevelt, and only once has he made a response critical of workers' tactics. That was when John L. Lewis, during the General Motors troubles, suggested that an obligation went with the political support the C. I. O. had given the President. Mr. Roosevelt confined him-

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self then to a general remark that 'this is no time' for statements and headlines.

"Mr. Lewis, it is reported by those with whom he discussed the subject, was both irritated and alarmed by the President's comment. One intimate quoted him privately as saying that if Mr. Roosevelt was against him he wanted to know it, and that when these words were relayed to the

President, the answer was returned that Mr. Roosevelt was for Mr. Lewis 'one hundred per cent.' The quotation came from a reliable person, then most friendly to both the distinguished principals. But it is possible—Washington being the whispering-gallery it is—that the narrative, including the 'hundred per cent,' can be well discounted. Nevertheless, the President's unique comment was mild, and relations

between the master of C. I. O. and the White House are still very friendly."

Who Is Master Now?


Under the heading, "Who is the Master Now?" The New York Sun comments editorially as follows:

"As an example of White House dissimulation the message on avoidance of taxes was unpleasant enough. But a stronger word—hypocrisy—is necessary to describe the present White House stand on the steel strike. The President, according to the inspired word, 'contemplates no personal intervention now or in the near future.' The hands-off policy is in force.

"This is as if a man, having started a mass of boulders down a mountainside, should complacently view their increasing velocity as they neared a village below and explain that his hands were off and that only gravity was to blame for whatever might happen. Yet in setting the boulders in motion he would have done exactly what the New Deal has done to produce strikes where there should be enterprise and prosperity, and violence where there should be peace.

"Every act of the Roosevelt Administration that dealt with labor has been an incentive to the destruction of American business. The New Deal did not succeed with all of its legislation. Some of it was void, some of it unworkable. But John L. Lewis could not be declared unconstitutional. The National Labor Relations Board may not be able to function, but John L. Lewis functions. So long as he commands the New Deal, so long as he can intimidate Governors and Mayors he will control. He must have laughed when the President announced the hands-off policy and laughed again when the Labor Relations Board, to which Mr. Roosevelt referred requests for intervention, said that it could not act.

"In his bitter speech on the Saturday night before last election Mr. Roosevelt, attacking business men as 'forces of selfishness and lust for power,' expressed the hope that in his second Administration they would meet their master. It was assumed then that by 'master' he meant himself. But Lewis and not the President is the master now. Almost every strike, act of violence or violation of the laws of property can be traced to his policy. And his is not a hands-off policy. The President made him potent; Lewis does the rest."




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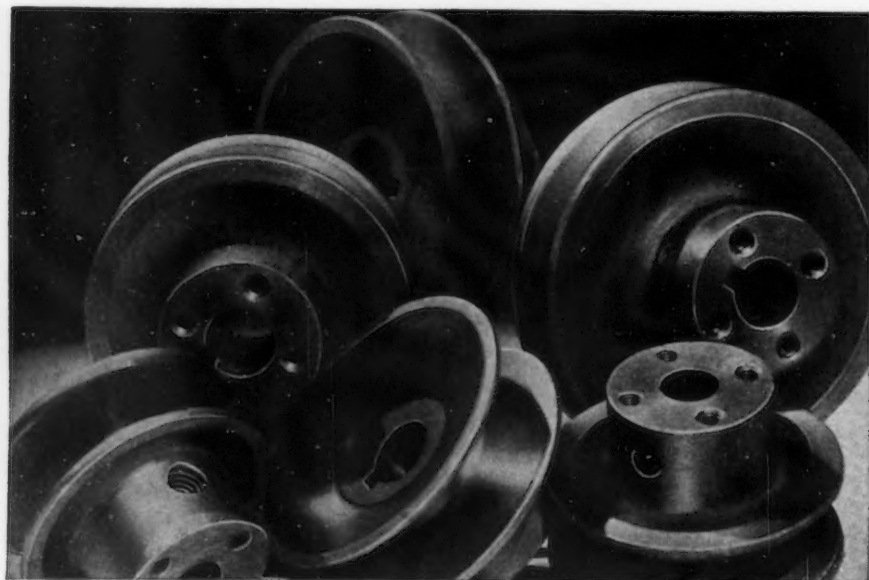
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Landis Tool Co. 40 Years Old

LANDIS TOOL CO., Waynesboro, Pa., recently celebrated the fortieth anniversary of its incorporation. At the same time tribute was paid to J. Elmer Frantz, president of the board of directors, who has been with the company since its incorporation in 1897 and even seven years prior to that time.

Mr. Frantz told the assembled employees of the events leading up



J. E. FRANTZ

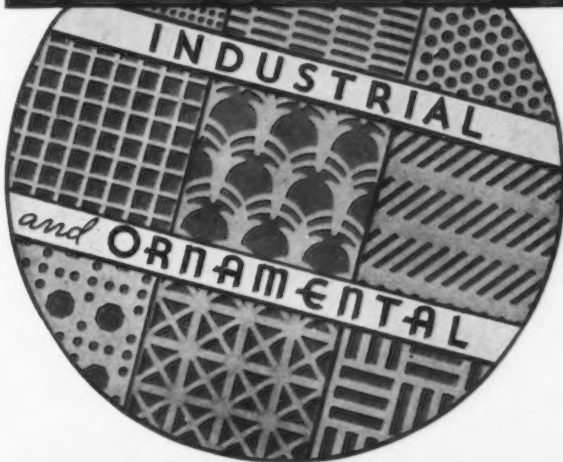
to the formation of the company and then outlined its development. Two brothers, F. F. Landis and Abram Landis, had been employed by the Geiser Mfg. Co. of Waynesboro in the early eighties. When need for a grinding machine arose for use in connection with the manufacturing of certain parts, they designed and built a small universal grinder. It operated very successfully, especially after provision had been made for the use of a large volume of coolant during the grinding operation. This, incidentally, was not generally realized at the time as being necessary for the successful operation of a precision grinder. During 1889 the brothers decided that the grinding machine had a bright future and they formed a partnership known as Landis Brothers to manufacture various types of grinders. Shortly afterward, in 1890, J. Elmer Frantz associated himself with the new organization. Then in 1897 the plant was destroyed by fire, but by this time there had been a growing realization on the part of many citizens of Waynesboro that the company was destined to mean much to the community. Capi-

tal was raised, a corporation was formed, the plant was rebuilt and manufacturing operations were resumed.

The first machine was a universal type of grinder which weighed about 2300 lb. For several years nothing was built but several sizes of the universals, but gradually other types of grinders

were added to the line and the machines became heavier and more complicated. Now there are almost 150 sizes and types of machines. The smallest is a 12x28-in. universal and tool grinder which weighs 3500 lb. while the largest is a 60x132 in. roll grinder weighing only a trifle less than 100 tons. Mr. Frantz pointed out the rela-

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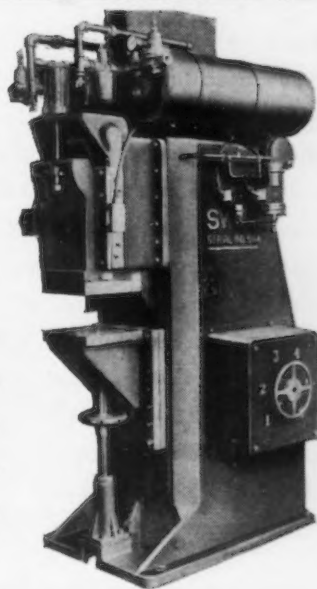
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Welding machines hand, hydraulic, cam or air operated of the following types: spot, seam, projection, flash, butt, flue and pipe, and gun welding units.



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AT THE BEACH, on the country club floor, even in the office, textiles spice the scene with distinction and charm.

Yet even a dyed-in-the-wool steel man, as he admired some sun-bathing beauty, wouldn't give a thought to the textile industry's use of stainless steel. As he stepped to swing music, he'd scarcely reflect that perhaps Lebanon Circle L Steels had helped to create the faultless texture of his partner's gown. But, the fact remains that stainless steel's work in textiles has added to the world's gaiety and pleasure as well as to the textile maker's profit.

Throughout the textile industries

—in pumps, propellers, valves and fittings — Lebanon Circle L Steels are being used to fight insidious corrosion. Against this sneaking foe "Circle L" Alloys — cast to a standard, not to a price—oppose a shining buckler to safeguard equipment, product quality and earnings.

ON GUARD! Your business, too, must be ever alert to loss from the industrial criminal, corrosion. Overlook no opportunity to protect plant investment and production efficiency. Check up and see if you are getting the greatest possible life from equipment—then confer with a Lebanon engineer. If there are unsuspected uses for alloy steels in your establishment, such a conference may disclose them.

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tionship between modern grinding equipment (and all, machine tools for that matter) and the low price of many of today's conveniences and necessities. He showed that 30 years ago medium priced automobiles sold for between \$1,500 and \$3,500, so that only people with above average income could afford to purchase a car. The advent of machine tools, among other things, so reduced the cost of manufacture that more and more persons could purchase cars. The increased demand had the effect of still further lowering the price. In this manner modern machine tools have contributed to the low cost and widespread distribution of more things than the average person realizes.

Mr. Frantz said that six of the 63 employed at the time of incorporation are still on the payroll of the company. Eighty of the present employees have been connected with the company for 25 years or more. Comparing the average wage rate today with that which existed in 1897, there has been an increase of about 350 per cent. At the time the Landis Tool Co. was incorporated there were 77 stockholders, whereas now there are over 500.

Shipping Obsolete, Says J. A. Farrell

DECLARING that most of the United States' merchant marine is obsolete and in need of rebuilding, James A. Farrell, former president of the United States Steel Corp., in an address before the graduating class of the Webb Institute of Naval Architecture, New York, said: "It has been the misfortune of the United States to be influenced in its shipping policy by regions remote from the sea, and in consequence to fall behind other countries. After persistent efforts to arouse the nation and Congress, a new shipping act has brought into existence a Maritime Commission which is empowered to restore the American merchant marine to effective dimensions commensurate with the nation's needs."

"It is believed," Mr. Farrell added, "that under the new commission this will be accomplished. The present vessels are for the most part obsolete and no longer capable of meeting the competition of other countries. An American merchant marine today means virtually the building of a new fleet to replace existing vessels, only a small percentage of which are modern and suitable for commercial and naval requirements."



..PERSONALS..

J. J. MORTIMER has been appointed superintendent of the blooming and plate mills at the Gary works of the Carnegie-Illinois Steel Corp. He has been at the corporation's South works since 1905 and has served as superintendent of the 96-in. plate mill and the 44-in. slab mill since 1936.



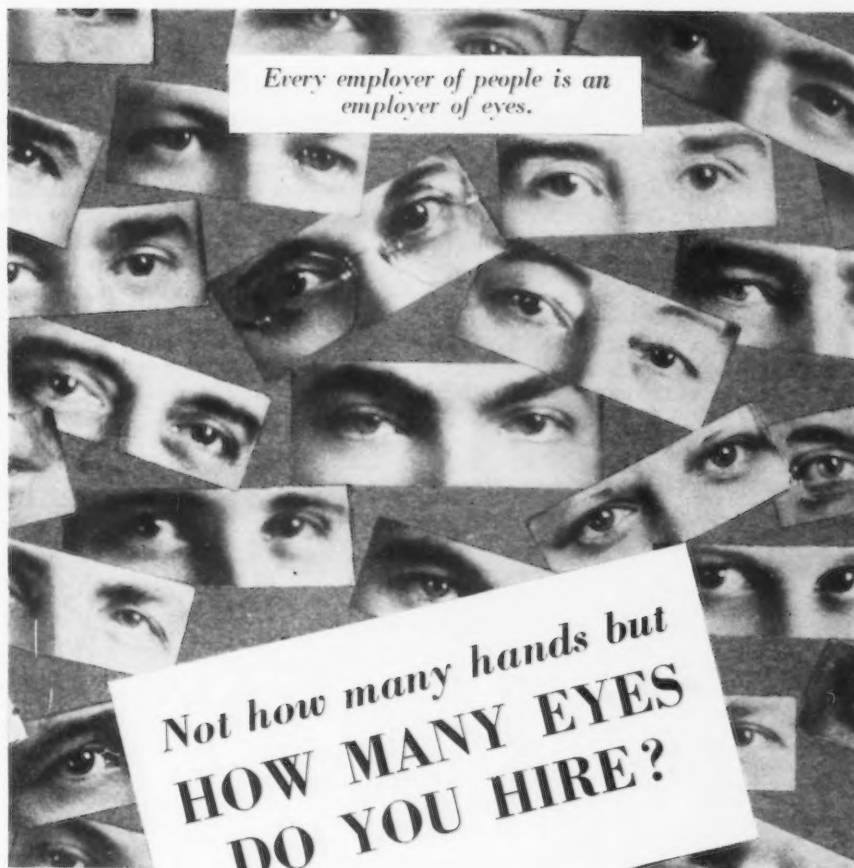
MALCOLM F. McCONNELL, general superintendent of the Homestead works of Carnegie-Illinois Steel Corp., Pittsburgh, on June 9 received the honorary degree of Doctor of Science from his alma mater, the University of Pittsburgh. Mr. McConnell has been associated with subsidiaries of the



J. J. MORTIMER



M. F. McCONNELL



Industrial eyes especially need more light these days to see close manufacturing limits and measurements which are so increasingly important. One way to give them all the light you pay for is to insist on using Edison MAZDA lamps . . . the kind that *Stay Brighter Longer* and provide the maximum amount of light for the current consumed.

Few people realize what a vast difference in quality there is between

Edison MAZDA lamps and many of the substitutes offered. Actual photoelectric measurements show that inferior bulbs often give 30 per cent less light than good lamps of equal wattage. And even a 2% loss is poor economy for the industrial or commercial user of light.

To save men and money in your plant, use only good lamps . . . such as Edison MAZDA lamps. The General Electric trade-mark on the end of each bulb assures you of full lighting value for your money. General Electric Company, Dept. 166, Nela Park, Cleveland, Ohio.



THE G-E LIGHT METER measures lighting. It tells whether employees are getting light for easy seeing, and is helpful in checking from time to time on whether this amount of light is being maintained. Costs only \$11.50.

EDISON MAZDA LAMPS
GENERAL  ELECTRIC

They stay brighter longer →



U. S. Steel Corp. since he went to the New Castle works in 1905 as a steam engineer. The university, in bestowing the honor upon its former graduate, said that the degree was conferred for Mr. McConnell's "citizenship and achievements in industry."

He was born at New Castle, Pa., on Nov. 3, 1870, received his grade and high school education there and entered Pitt in 1886-87. He remained three scholastic years, then was out until the school year 1901-

02, when he was graduated with the degree of mechanical engineer. For two years after leaving college he was with the LaBelle Iron works at Steubenville, Ohio, as a construction engineer. In the following January he entered the Carnegie Steel Co. and worked in the New Castle plant, the city office in Pittsburgh, and the Mingo and former Bellaire works in various official positions until Aug. 1, 1933, when he assumed the position he now holds at Homestead.

GEORGE W. BUTLER has been appointed manager of conduit sales for Steel & Tubes, Inc., Cleveland. Mr. Butler has been for four years assistant midwest district sales manager of this Republic Steel Corp. subsidiary, in Chicago. Prior to this he spent three years in the company's Wichita and Kansas City offices. HOWARD F. COWARD, who has been with the Kansas City staff of Steel & Tubes for the past four years, has succeeded Mr. Butler as assistant midwest district sales manager in Chicago. HOWARD H. LOVING has been appointed Steel & Tubes representative in Kansas City. He spent two years in the Chicago office of the company and during the past year was representative of the company in Dallas, Tex.

♦ ♦ ♦

JOSEPH L. TRECKER, treasurer of the Kearney & Trecker Corp., Milwaukee, has been elected vice-president to fill the vacancy caused by the resignation of PHILIP P. EDWARDS, who resigned recently to become an executive of the Ingersoll Milling Machine Co., Rockford, Ill. O. W. CARPENTER, secretary, has been given added duties as treasurer. THEODORE TRECKER has been reelected president.

♦ ♦ ♦

OSCAR F. PATZKE has been appointed sales manager of the Smith Steel Foundry Co., Milwaukee, formerly known as the Geo. H. Smith Steel Casting Co. He has been a production as well as a sales executive of Milwaukee steel casting shops for more than a quarter of a century. For 12 years Mr. Patzke was connected with the old National Steel Foundries, Inc., Milwaukee, division of the National Brake & Electric Co., which merged with Westinghouse Electric & Mfg. Co., Pittsburgh, about 10 years ago. More recently he has been associated with the Milwaukee Steel Foundry Co. in sales work.

♦ ♦ ♦

FRED L. PLUMMER, professor of structural engineering, Case School of Applied Science, has been elected president Cleveland Engineering Society for the coming year, WARD HARRISON, director engineering, General Electric Co., vice-president, and HOY STEVENS, process engineer, Cleveland Railway Co., treasurer. FREDERICK C. CRAWFORD, president Thompson Products, Inc., is one of the new trustees.

♦ ♦ ♦

BERRY THOMAS, General Motors Building, Detroit, is the new facto-



CHIMICALS . . . Salts . . . Buffs . . . Anodes . . . Equipment . . . for every plating and polishing problem, you will find the right answer in Udylite's complete line of supplies and equipment.

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ry representative of the Hanson-Whitney Machine Co., handling taps, gages and other precision equipment. For many years Mr. Thomas was with the Ford Motor Co., representing it in Europe for a time and acting as supervisor of the Differential Gear Division both at the River Rouge plant and at the old Highland Park division. He received his early mechanical training in the Polytechnic Institute, London, and his general education at London University, followed by further studies in this country.



W. P. MARQUIS has been appointed works auditor of the new Irvin works of Carnegie-Illinois Steel Corp. He formerly was chief, bureau of costs, at the company's general offices at Pittsburgh. Mr. Marquis has been employed by subsidiary companies of the U. S. Steel since 1913 when he was an accountant at the Shenango works of the then American Sheet & Tin Plate Co. He then spent a year with the ordnance department of U. S. Steel at Neville Island and later was transferred to the Gary, Ind., tin mill where he later served as chief accountant for five years. Following this he entered the bureau of costs in the local offices of the sheet and tin plate company in 1929 and in 1932 became chief of the bureau, continuing in that capacity until consolidation of the sheet and tin company with Carnegie-Illinois in June, 1936. Mr. Marquis at that time was named chief of the bureau of costs of the combined companies and served continuously until his recent appointment.



FRANK P. DAHLSTROM has joined the staff of the Aetna-Standard Engineering Co., Youngstown, as electrical engineer. Mr. Dahlstrom has specialized in the electrical field, but has accomplished notable work in the mechanical field, having designed an oil lubricated bearing for use on mill roll necks. This patented bearing has resulted in reducing power requirements by as much as one-half in certain types of mills.



R. E. ZIMMERMAN, vice-president in charge of metallurgy and research of United States Steel Corp., sailed June 10 on the Bremen for a four-weeks' visit to Germany, France and England. While in Europe Mr. Zimmerman will study recent developments in the technology of processes for the production and treatment of various grades of iron and steel.

GOSTA LOFBERG, who has been president for the past few years of S.K.F. Steels, Inc., has resigned to become president of Uddeholm Co. of America, Inc., New York, effective July 1. He succeeds E. T. CORBUS, who has been made chairman of the board and treasurer. ERIK ENEVIK will continue as vice-president, in charge of the Chicago branch. Prior to his association with S.K.F. Steels, Inc., Mr. Lofberg was for many years vice-

president of the Uddeholm company.



GEORGE T. LONG, who has had a wide background of experience in home heating and three years of residential air conditioning experience in the field with the Carrier Corp., Newark, N. J., has been placed in charge of the newly created residential air conditioning department of the company. Other





Excellent weldability. Requires no treatment to prevent brittleness.



Lends itself readily to difficult cold forming and cold flanging.



Perfect welding was here so readily achieved with "70-90" that fabrication time was cut.


Reduce Dead Weight Safely — and Lower Your Operating Costs

To meet today's compelling need and insistent demand for strength without weight, "A.W."-"70-90" Super Strength Steel was specifically developed and is offered with complete assurance to Industry in general and Transportation in particular.

Costs must be lowered. Speeds must be raised. Pay loads must be increased. By cutting dead weight as much as 40% without loss of strength, "A.W."-"70-90" offers its important contribution to the solution of these problems.

"70-90" has the added qualities of corrosion resistance far superior to that of all ordinary steels, remarkable fabrication facility, and excellent welding properties. And its cost is low.

Write for literature and call on our Engineering Departments for competent collaboration.

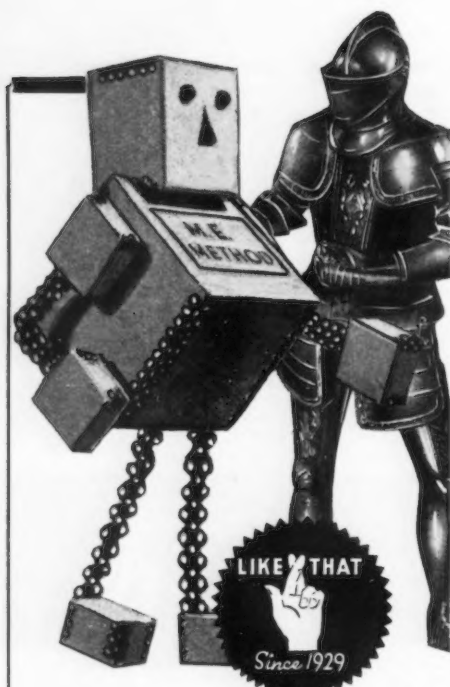


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Branches: Philadelphia, New York, Boston, Detroit, Los Angeles, San Francisco, Seattle, Houston

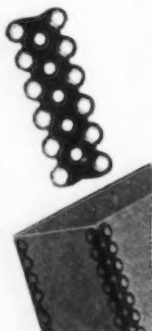
141 YEARS' IRON AND STEEL MAKING EXPERIENCE



The solid bond between Mr. M. E. Method and our Blue Knight started with the solution of this problem.

WANTED—both transparent and opaque coatings for converting raw cold-rolled steel strip into the finished article in *one continuous operation* . . . without primer. The finish must withstand these operations without *chipping, flaking or peeling*:

1. Reeling after finishing.
2. Slitting, Blanking and Punching.
3. Re-reeling in 300 ft. coils.
4. Feeding the edging through the stayer which cuts strip to right length, applies it and *clinches* it on box corners.
5. There must be no brittling during time-lapses.



Metal Edge Boxes (strongest known) have a wonderful reputation for "taking it". ROXALIN Flexible Finishes do their part by thriving on abuse without CHIPPING, FLAKING or PEELING!

Mr. M. E. Method is a familiar figure in many plants where the executives in charge of finishing never dream that some of their surface coating heart-aches can be cured by these abuse-resistant, stand-up-and-take-it Blue Knight Flexible Finishes.

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FINISHES

CELLULOSE & SYNTHETIC TYPES ENGINEERED FOR SPECIFIC PERFORMANCE

ROXALIN FLEXIBLE LACQUER CO., INC.
Box 276 Elizabeth, N. J.

Please send illustrated summary featuring sample "Twist and Bend" strips, giving full details on your NO CHIPPING, NO FLAKING, NO PEELING (Air-dry) finishes.

Signed
Attach this coupon to your company letterhead, please.

additions to the Carrier design and application engineering force include STANLEY ELLISON and DONALD FLYNN, commercial refrigeration; E. L. HINCHLIFF, public utilities; MORTIMER LANSING and C. R. DAVISON, portable summer air conditioner; and E. D. GREINER and GEORGE SCHEELE, dealer development.

♦ ♦ ♦

R. R. LAPELLE, who was formerly with the Salem Engineering Co., has become associated with the Philadelphia Drying Machinery Co., as a member of its industrial furnace division.

♦ ♦ ♦

ALLAN P. STERN has become associated with the Colonial Iron Works Co., Cleveland, in an executive capacity, also as estimating and contact engineer. He is a graduate of the Case School of Applied Science in mechanical engineering.

♦ ♦ ♦

CARL SAWADE, general sales manager of the Utica Radiator Corp., Utica, N. Y., will also assume sales direction of the company's new air conditioning division. He will divide his time between Utica and the recently-opened New York office.

♦ ♦ ♦

CHARLES H. STOECKLE, of the Crucible Steel Co. of America, has been made chairman of the Philadelphia chapter of the American Society for Metals. ADOLPH O. SCHAEFER, of the Midvale Co., has been made vice-chairman; FRANKLIN H. PENNELL, of the Autocar Co., is the new secretary, and GEORGE P. KRAEMER, Edgar T. Ward's Sons Co., is treasurer. Directors are: T. HOLLAND NELSON, consulting metallurgist; H. SMEDLEY ROYAL, Edgar T. Ward's Sons Co.; EDWARD A. SNADER, Westinghouse Electric & Mfg. Co.; GEORGE W. KELLER, George W. Keller Co.; RICHARD C. JORDAN, Chicago Flexible Shaft Co., and JOSEPH WINLOCK, Edward G. Budd Mfg. Co.

♦ ♦ ♦

ROBERT C. DALLIES, formerly sales agent for the Gulf States Steel Co., has been appointed sales representative for the Republic Steel Co., operating out of its St. Louis office in the Paul Brown Building.

♦ ♦ ♦

ROBERT W. DIERKER has been appointed sales manager of the Gary Screw & Bolt Co., Peoples Gas Building, Chicago. GERALD J. GARVEY has been made assistant sales manager.

...OBITUARY...

AXEL SAHLIN, well known for many years to American steel works engineers, died at the home of a relative in York, Pa., June 10, aged 81 years. He served as rails inspector in England, Germany and Belgium in 1880. Coming to this country in 1881, he was connected with the blast furnace department of the Cambria Steel Co. and continued



AXEL SAHLIN

there until 1886. For a number of years he was blast furnace superintendent of the Sparrows Point plant of the Maryland Steel Co. Later he established a London office for Julian Kennedy, of Pittsburgh, and from 1903 to 1914 he was a partner in Julian Kennedy-Sahlin & Co. Ltd., of London and Brussels. In the six subsequent years he built blast furnace plants in Europe, Asia and Africa. In 1920 he became head of the International Construction Ltd., of London, which had a number of important contracts for iron and steel construction in Great Britain.

Soon after the formation of the United States Steel Corp. in 1901, Mr. Sahlin and the late J. Stephen Jeans, then editor of the London *Iron and Coal Trades Review*, were sent to the United States as special representatives of the British Iron Trade Association. Their mission was to make a survey of the steel trade of this country to measure the effect of the steel consolidations of 1898-1901 on the competitive position of the United States in the steel export trade. Their report, which made a considerable volume, stressed the modernization of Amer-

ican steel plants and the newly developed economies of production and urged that British steel makers must at once plan for rebuilding on a large scale if they would hold their position in international trade.

Mr. Sahlin was decorated three times by his native Sweden.



WILLIAM S. DAVENPORT, president and general manager of the Davenport Machine Tool Co., Rochester, N. Y., died in that city on June 7, aged 76 years. He had been identified in an executive capacity with the company he organized since 1919. He was a member of the American Society of Mechanical Engineers.



FRANK H. WILLARD, president and general manager of the Graton & Knight Co., Worcester, Mass., died of a heart attack on June 5, aged 71 years. With little more than a grammar school education, Mr. Willard rose from an errand boy to the presidency of the company. His entire business life was spent with the one company. On Jan. 26, 1883, when he was 17 years old, Mr. Willard started as errand boy with the Graton & Knight Co. There were 38 men in the organization then. From errand boy he became a leather cutter and at the end of his first 10 years rose to a foreman's position. In 1898 he became superintendent of the belt shop and in 1901 general superintendent. Twelve years later, in 1913, Mr. Willard became assistant general manager of the company and in 1917 he was made vice-president and general manager. When the company was reorganized in 1926, Mr. Willard became president.

Mr. Willard was active in civic and educational affairs in Worcester, having been a trustee for many years of the Worcester Independent Industrial Schools, the Worcester Boys' Trade School and vice-president and director of the Hahnemann Hospital. In 1930 he was vice-president of the National Association of Manufacturers, and president of Associated Industries of Massachusetts in 1931.



FRANK L. UHL, for the last 10 years president of the Detroit Brass & Malleable Works, died June 10 from a heart attack. Mr. Uhl, born in New Washington, Ohio, 58 years ago, began his work with Detroit Brass & Malleable Works 20 years ago as a salesman.



WILLIS LAW TINKER, secretary Lake Superior Iron Ore association, Cleveland, died at his home in Hudson, Ohio, June 5, aged 53 years.

Maintenance WELDING AND CUTTING EQUIPMENT



Weldit Cutting TORCH

For general cutting. Furnished with Monel heads and tubes. Optional heads 70°, 90° or straight. Length 21". Weight 2 lbs. 12 oz. Thousands in service.



Weldit Welding TORCH

For general welding. Tip sizes 3 thru 12. Length 18". Weight 1 lb. 9 oz. A very popular seller for all kinds of maintenance work.

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FOR TWO WEEKS
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The development of shearing machinery occupies a prominent part in the engineering activities of the THOMAS organization. For years we have furnished the largest metal-working plants with the right type of shearing equipment, as well as other fabricating machines of all kinds.

If you have need for punches, spacing tables, multiple drills or special metal-forming and metal-working units, call on the THOMAS organization of experienced, specialized craftsmen!

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SPACING MACHINE CO.

PITTSBURGH, PA.

FABRICATING MACHINERY

PRESSES • DIES • METAL-FORMING MACHINERY

BENDING AND STRAIGHTENING MACHINES • MULTIPLE DRILLS

Mr. Tinker had been in poor health for some time but the immediate cause of his death was a heart attack. He had been connected with the ore association for 30 years and had been its secretary for 25 years. He had been a member of the American Institute of Mining and Metallurgical Engineers.

♦ ♦ ♦

GEORGE A. PAYNE, treasurer Wood Shovel & Tool Co., and American Pullmatch Co., Piqua, Ohio, and former treasurer Otis Steel

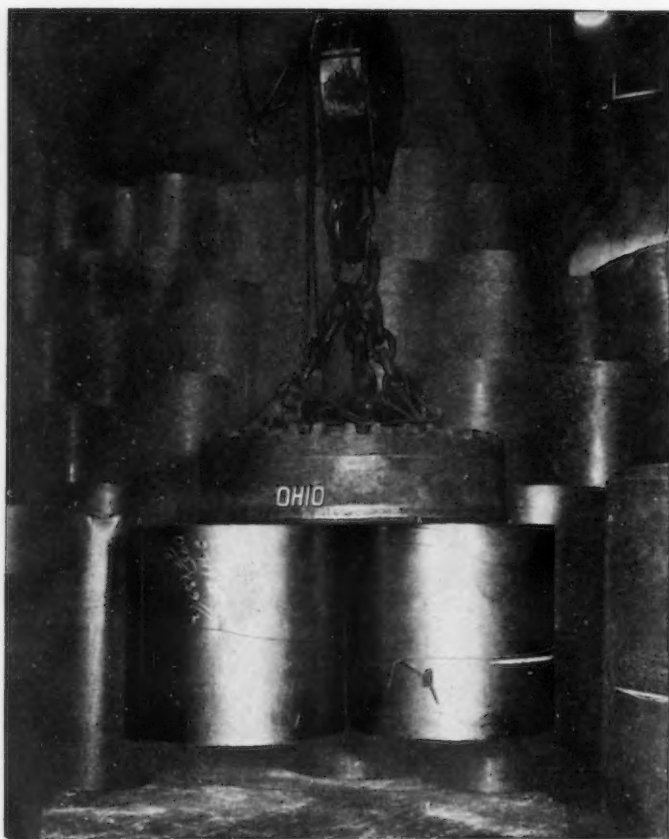
Co., Cleveland, died June 8, aged 56 years. He became auditor of the Otis Steel Co. in 1916 and subsequently served as assistant secretary and assistant treasurer and in 1927 was appointed treasurer. He left the Otis organization in 1929 because of poor health.

♦ ♦ ♦

HENRY COULSON BOND, former British tin plate industrialist, who retired from the chairmanship of Richard Thomas & Co. in 1931, died on June 12, aged 72 years.

ANTON C. HEINZEN, one of the best known figures in the fabricated steel industry of the Central West, died at his home in Wausau, Wis., on June 7, aged 58 years. He was born in Sheboygan, Wis., and learned the boiler and structural trade there. Later he became superintendent of the Manitowoc Boiler Works at Manitowoc, Wis. In 1904 he was one of the founders of the Northern Boiler & Structural Co. at Appleton, Wis., and in 1906 he founded and became president of the Wausau Iron Works, serving in that capacity until his retirement from active business in 1933.

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**The Super or Double Strength 65"
Ohio lifts up to four (4) 9000 lb.
rough coils just off the hot mill**

A 36,000 lb. Lift

THE OHIO ELECTRIC MFG. CO.

5908 Maurice Avenue, Cleveland, Ohio

OHIO *Reliable* MAGNETS

The Control of Electrically Driven Machinery

(CONTINUED FROM PAGE 56)

smoothly and slowly. The reverse operation occurs when the stop button is pressed.

Reversing Inductive Control. The inductive method of acceleration control has found a wide application in connection with auxiliary drives in steel mills and on cranes. (See "Inductive Accelerating Contactors" above). A further development is that of "reversing plugging" control. When a motor is "plugged" (that is, connected to the line in the reverse direction while it is still running full speed in the forward direction) the armature counter-electromotive force which has been opposed to the line voltage is now added to the line voltage, so that the total voltage across the resistance is about 180 per cent of line voltage. As the motor decelerates in the forward running direction this voltage drops, until at zero speed only line voltage is left. The motor then starts accelerating in the reverse direction, just as if it were starting from rest. Reversing inductive control uses the time delay features of inductive contactors and relays to make the necessary circuit changes occur in proper sequence and with safety. Various developments of this inductive time limit principle are embodied in the General Electric mill type control, the Clark delayed time contactor, and the Electric Controller & Mfg. Co.'s time delay relay.

(TO BE CONTINUED)



..TRADE NOTES..

Tubular Service Corp., New York, has opened a new warehouse and sales office at 1031 Beaver Avenue, N.S., Pittsburgh, for the distribution of steel tubing, boiler tubes and seamless steel pipe.

Federal Products Corp., Providence, R. I., has moved its Detroit office and service department to 7310 Woodward Avenue.

Roots-Connersville Blower Co., Connersville, Ind., has announced the appointment of the following representatives: C. B. Sunderland, Muncie, Ind.; J. J. Heinrichson, Kansas City; and P. C. Rowe, Newark, N. J.

Joseph Monahan, Grand Rapids, Mich., machine tool engineer and agent, has moved to 351 Indiana Avenue, N.W.

General Engineering Equipment Co., Indianapolis, has been appointed agent of the Pennsylvania Pump & Compressor Co., Easton, Pa., in the Indianapolis territory.

E. F. Houghton & Co., Philadelphia, have announced the organization of a research sales staff, under the direction of L. D. Holland, for the purpose of developing new products, bettering existing products, and acting as consultants to such plants as desire this service. The staff will consist of four divisions, with managers, as follows: Textile research, H. C. Roberts, manager; lubrication, C. P. Green; metal-working, G. W. Esau; leather, J. N. Smith.

Earl E. Knox Co., Erie, Pa., air compressor rebuilder, has moved to Eight West Second Street.

Sun Machinery Co., Newark, N. J., is now located at 115-121 Hanford Street.

Revere Copper & Brass, Inc., New York, has opened a branch office at the Capitol National Bank Bldg., 410 Asylum Street, Hartford, Conn.

Cutler-Hammer, Inc., Milwaukee, has announced the opening of a new office at 1106 Central Tower, Youngstown. E. J. Gove is manager.

Central Foundry Co., New York, has moved its show rooms and general offices to 386 Fourth Avenue.

Giebel Machine Tool Co., Inc., New York, has been appointed exclusive representative in the New York territory by Bryant Machinery & Engineering Co., Chicago. A complete line of milling and drilling machines, lathes and grinders will be carried.

Ideal Commutator Dresser Co., Sycamore, Ill., has moved its New York offices to larger quarters at 61 East 11th Street.

Burklyn Machinery Co., Syracuse, N. Y., has been appointed general distributor in that city for Pioneer Engineering & Mfg. Co.'s line of coolant and lubricant pumps.

Dampney Co. of America, Boston, manufacturer of protective coatings for metal, has opened a branch office at 425 Citizens and Southern National Bank Bldg., Atlanta, with W. R. Carter in charge of the office.

L. W. MacLean of the Philadelphia office has been transferred to the New York office.

Struthers-Wells Co., with manufacturing plants at Warren, Pa., and Titusville, Pa., is now represented in Pittsburgh by Goldsborough & Vansant, Inc., with offices in the Farmers Bank Building.

Metal Stampings, Inc., Toledo, Ohio, has been organized by William L. Peters, formerly vice-president and general manager of the Toledo Stamping & Mfg. Co., to develop a new die and stamping business in a former steel wool plant at Perrysburg, Ohio.

New Britain-Gridley Machine Division of the New Britain Machine Co., builder of multiple-spindle screw and chucking machines, has appointed J. J. Barry Western representative, with headquarters in Chicago.

Sterling-French Machinery Co., New Center Building, Detroit, has been appointed representative of the Arter Grinding Machine Co., Worcester.

Kearney & Trecker Corp., Milwaukee, manufacturer of milling machines, has voted to change its authorized capitalization from \$1,250,000 of common and \$500,-

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COLD DRAWN STEELS

NO need to incur the expense of machining Wyckoff Cold Drawn Steel Bars with the wide variety of standard sizes and shapes readily available through Wyckoff Warehouse Stocks.

In Wyckoff Cold Drawn Bars you not only obtain a complete choice of size tolerances but also a bright, smooth surface which cuts machining costs to a minimum. Why not obtain lower production costs, higher profits and more business with the aid of Wyckoff Cold Drawn Steel?

WYCKOFF DRAWN STEEL COMPANY

General Offices: First National Bank Bldg., Pittsburgh, Pa.
Mills at Ambridge, Pa. and Chicago, Ill.

Manufacturers of . . . Carbon and Alloy Steels . . . Turned and Polished Shafting . . . Turned and Ground Shafting . . . Wide Flats up to 12" x 2"
Warehouse stocks carried by nationally known distributors.

000 of preferred stock to 200,000 of common stock of \$10 par value, or a total capital stock of \$2,000,000.

Graham Transmissions Co. is moving its general offices from Springfield, Vt., to 739 North Broadway, Milwaukee. For the present, production will be continued in works of Fellows Gear Shaper Co. at Springfield. Associated with Mr. Graham is Alain Madle, formerly with New Departure Mfg. Co., Bristol, Conn., who resigned some time

ago to become chief engineer of Graham firm.

Ajax Flexible Coupling Co., Westfield, N. Y., has opened three new sales offices, in Akron, Kansas City and Seattle. Its distribution set-up now includes 24 cities from coast to coast. Beese & Terry will represent Ajax in Akron; Arthur D. Schwartz will cover the Kansas City territory, and W. F. Nichols serves the area centering around Seattle.

Dodge

Steel castings have pointed the way to solution of many design problems in the manufacture of machinery and metal products. Dodge steel castings, because of their exceptional quality, have effected numerous such improvements.

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Foundrymen Will Meet on Aug. 12

MEMBERS of the American Foundrymen's Association have set Aug. 12 as their special day at the 1937 Great Lakes Exposition, which opened in Cleveland May 29.

Several hundred members of the northeastern Ohio and nearby chapters will meet that day on the exposition grounds for dinner and to hear talks by national officers. L. P. Robinson of the Werner G. Smith Co., Cleveland, is in charge of arrangements.

International Steel Congress June 21-25

THE program of the Sixth International Congress for Steel Development, to be held in Düsseldorf, Germany, and Paris, France, June 21-25, will include several trips to the World's Fair in Paris, and the Exposition in Düsseldorf.

Papers will be read on "Protection of Steel Frame Buildings Against Fire," and "The Influence of Ductility on Steel Construction." The American industry is to be represented at the congress by the American Institute of Steel Construction.

Lake Steamer Breaks Ore-Carrying Record

A NEW record of the largest amount of iron ore carried by a Great Lakes vessel was established June 10 when the steamer Harry Coulby of the Interlake Steamship Co. arrived at the Fairport, Ohio, harbor, with 15,031 gross tons of ore shipped from Two Harbors, Minn. The largest ore cargo previously shipped from the head of the Lakes to a Lake Erie port was in 1929 when the Coulby took a cargo of 14,617 gross tons to Conneaut, Ohio. However, a cargo of 14,859 gross tons was carried from the head of the Lakes to Sault Ste. Marie by the steamer Donnacona in 1928 and last year the steamer L. E. Block took 14,651 gross tons from Lake Superior to Lake Michigan.

Dravo Corp. of Pittsburgh was low bidder for a 250-ton gantry crane of the screw hoist type and a transfer car to be erected at the Naval Proving Grounds at Dahlgren, Va. Dravo's bid was \$153,890.

Labor Board to Decide Pivotal Issue In Steel Strikes—Signed Agreements

WASHINGTON, June 15.—John L. Lewis' demand for signed agreements with steel companies is approaching a test. Agreeable to CIO wishes, the National Labor Relations Board has made this issue, the keystone in the steel strike situation, the object of a complaint against the Inland Steel Co. It charges that the company has refused to bargain collectively with the SWOC because it would not sign an agreement with the union. The board claims, as do CIO and its affiliate, SWOC, that this is a violation of Section 8(5) of the National Labor Relations Board (Wagner) Act, which holds it an unfair labor practice to refuse to bargain collectively with the representatives of a majority employee representation. The board said a hearing will be held at Chicago on June 25.

Passing by the question as to whether SWOC represents a majority of Inland employees, a matter that has not been tested, the board position has been vigorously challenged by steel companies. They insist that there is nothing in the Wagner Act which requires a signed agreement. In a letter published in the New York Sun of Nov. 5, 1935, Senator Wagner of New York, said that the act does not compel signing of an agreement. It is likely that the case will go to the courts to settle the issue. The board evidently hopes to establish the demand as a formula to settle not only the steel strike situation but as a means to prevent strikes generally.

Senator Guffey of Pennsylvania has also been active in supporting the contention that refusal to sign agreements is a violation of the Wagner Act. He emphasized this point last week on the floor of the Senate in the course of a vigorous attack on the Republic Steel Corp., the Youngstown Sheet & Tube Co., and the Inland Steel Co.

Supreme Court Ruled No Signed Agreement Is Necessary

In the Jones & Laughlin Steel Corp. case, Chief Justice Charles E. Hughes specifically said: "The act does not compel agreements between employers and employees. It does not compel any agreement whatever."

But it is said the matter of whether or not an employer can be compelled to sign an agreement once it has been reached is not cov-

ered in the decision. In other words, the point is conceded that an agreement cannot be compelled, but the question is as to whether in the event an agreement is concluded it must be reduced to writing and signed, a demand being made by SWOC and resisted by the steel companies. The Wagner Act itself says nothing about the point.

The former National Labor Board in the Houde Engineering Corp. and the National Aniline & Chemical Co. cases held that Section 7(a) of the NRA required agreement. But Section 7(a) and the old board went out the window when the Supreme Court knocked out NRA. And in the J. & L. case the court definitely turned thumbs down on the contention that agreements are compulsory.

The question now has been reduced to the fine point as to whether agreements once made must be put in written form and signed, a pivotal issue in the present strike situation.

The Inland company is also cited by the NLRB for two other violations of the act. An allegation is made that the company actively promoted a labor organization among its employees known as Steel Workers Independent Union, Inc. It is also stated that the company interfered with its employees in the exercise of their rights of self-organization by warning them not to join the SWOC or the Amalgamated Association of Iron, Steel and Tin Workers of North America.

The complaint states that these acts of the company caused the employees of the two plants to go out on strike on May 26, a strike which is still in effect.

Board Issues Complaint

The complaint was issued by the board after investigation of charges filed with it by SWOC and by Lodges 64, 1010 and 1101 of the Amalgamated, representing employees in the company's plants at Indiana Harbor, Ind., and Chicago Heights, Ill.

The board adds: "On June 8, 1937, the complaint states, the SWOC requested the company to set a time and place for bargaining negotiations looking toward a signed agreement with the SWOC. On that date J. H. Walsh, works manager, replied that while the

company would be willing to meet with the SWOC 'it did not propose to make a signed contract' with the SWOC. In this manner, and in other ways, it is alleged that the company has shown that regardless of the terms proposed by the SWOC, it would not enter into a signed agreement. It is declared that the company has negotiated with the SWOC in bad faith, in that it 'still does not intend to enter into an agreement . . . even though the terms proposed by the SWOC be acceptable to it.'"

College Graduates Join U. S. Steel

DEFINITE indication of the return of industry to the college campus in its search for trained men is seen in the announcement of the United States Steel Corp. that 594 graduates of 91 colleges and universities have accepted an opportunity of employment in subsidiary companies.

Recruiting committees were composed of men representing engineering, operating and sales departments of the various subsidiary companies of the United States Steel Corp. These committees spent the first five months of this year visiting universities and colleges in the 48 states and conferring with professors and student groups.

"The broad purpose of the new college recruiting program of the corporation," it is stated, "is to bring into the organization a number of specially-trained men each year. The initiation of this program does not mean that all important positions which may become available in the future will be filled by college men. It will continue to be the policy of the corporation to fill many important posts with employees who have not had the benefit of college training but who have worked their way up through the ranks. It is the aim, however, to put greater emphasis on the training of men, whether they be college graduates or not, so that there will be available a reserve of competent manpower to fill positions of responsibility as they occur."

Pittsburgh Des Moines Steel Co. has been awarded a contract by the Bureau of Yards and Docks of the Navy Department to construct three new radio towers 600 ft. high and to strengthen and recondition six existing 600 ft. towers. All of these towers are at Annapolis now. Total contract price is \$283,770.

Back-to-Work Movement at Youngstown May Result in Reopening Plants

YOUNGSTOWN, June 15. — Large independent steel manufacturers, with their plants remaining closed after three weeks of the strike sponsored by the John L. Lewis' steel union, were continuing at midweek to resist efforts by labor leaders or their political allies intended to force them to sign a labor contract with the Steel Workers Organizing Committee.

Both Youngstown Sheet & Tube Co. and Republic Steel Corp., with their biggest concentration of plants in the Youngstown area, and Inland Steel Co., centered in the Chicago district, are standing firm in their determination not to sign.

The latest attempt to force the three independent companies into line occurred during the last few days when Governor Martin L. Davey of Ohio arranged "peace" meetings at Columbus between representatives of Republic and Youngstown Sheet & Tube with Philip Murray, head of the SWOC, and other Lewis union leaders.

After Tom M. Girdler, Republic chairman, and Frank Purnell, Sheet & Tube president, had declined to attend but agreed to send their fully authorized representatives to the Davey meetings, the "peace" negotiations ran into difficulties at the outset with the Governor's proposal that the companies sign in exchange for some other concession, notably the giving up by the SWOC of its cherished objectives of the closed shop and checkoff of union dues.

Doomed to failure from the start, the Davey meetings gave the steel executives an opportunity to restate their position. They said they "believed they had no moral right to subject their employees to harassment and coercion leading to the closed shop."

Strike Developments

From the resisting steel companies' viewpoint, the three weeks' mark in the steel strike, already costing the nation's idle steel workers approximately \$10,000,000, found the companies in stronger

By JAMES A. ROWAN

position than at the beginning of the strike. They declare that:

1. Thinning picket lines at mill gates in the Youngstown, Warren, Niles, Canton, Cleveland and other areas clearly point to a loss of support for the strike and a desire by their workmen to return to their jobs as soon as protection is provided by the authorities.

2. More than two-thirds of the employees in large plants like Youngstown Sheet & Tube Co.'s Campbell works have signed cards signifying their desire to go back to their jobs and are on the verge of demanding that the county and city authorities in each instance provide protection, clearing away all except a reasonable, legal number of pickets at mill gates.

3. Public opinion is mobilizing behind them as they resist efforts by organized labor to seize greater control of the steel business, including the right to "collect huge sums in dues through the checkoff and arbitrary control of labor leadership."

4. Their leading customers have written or wired approval of the policy of agreeing to meet all wage and working conditions provided for in the standard SWOC contract first signed by Carnegie-Illinois Steel Corp., but refusing to sign a contract which they believe would result in an annual shutdown of the mills during arguments over wage scales and other points in new agreements.

5. Local authorities, under pressure from the public, are preparing to maintain law and order and to protect returning workers when a majority of the workers have shown they want to go back to work. Hundreds of deputies and special police with equipment such as tear gas guns and riot sticks have been hired in areas in which the strike-bound plants are located.

6. Lack of any substantial resentment on the part of large public groups to violence involving mill guards or others employed to protect plant property or maintain

order indicates a turning point in public sympathy away from organized labor, or at least away from organized labor leaders.

No Relief for Idle

From a practical point of view, steel manufacturers in the group opposed to signing contracts seem to have chosen a strategic battleground in selecting Youngstown, the capital of the independent steel industry. Union leaders found disadvantages. Railroads and the Mahoning River shut off many of the big Mahoning valley plants from access to the streets. Lack of nearby members of the United Mine Workers union (John L. Lewis' own organization which provided most of the money for carrying on the steel workers organizing drive) for picket purposes, as in some Pennsylvania mill areas, added to their difficulties.

Other obstacles which exist in the Youngstown area, as compared with some steel areas in other states, include a lack of relief funds which might support an indefinite shutdown if substantial enough even to maintain soup and bread lines. There are no other industries of size in the Youngstown area to which the striking mill workers can turn as the shutdown of their own mills continues.

Back of the independent companies' opposition to the SWOC contract is their insistence that such contracts are not provided for or required by the National Labor Relations Act which "assures rights of collective bargaining to employees but does not require or suggest written agreements."

As this article was written many signs pointed to an early attempt to reopen the mills here and elsewhere. Supported by heavily armed police, deputies, mill guards and railroad officers, the attempt seemed likely to come with the anticipated breaking up of Governor Davey's peace-making efforts.

The John L. Lewis union, clearly fighting the most desperate battle of its year-long career—the organization's first birthday came

June 17—depended on mass meetings the last few days to whip its picket lines into fighting mood before the attempted reopening.

While many, particularly a large section of the newspapers, forecast that the Davey meeting would result in some sort of a settlement ending the strike in which more than 70,000 men have been out of work since late in May, those closest to the negotiators were without hope from the start that the sharply diverging points of view of organized labor and the independent executives could be harmonized at this time.

Youngstown in Uproar

Through the past week only feeble efforts were made to settle the strike. The steel producers awaited a hoped-for crystalizing of public disapproval of the strike and tactics of club-swinging pickets walking streets in the Mahoning Valley mill communities. The week's strike log follows:

June 9—A reported threat by strikers to "capture" the Mahoning County jail where 100 special deputies were quartered had Youngstown in an uproar. This threat, which brought no action, was made after Sheriff Ralph Elser's deputies rescued 10 newly-enlisted officers who were attacked by union sympathizers when they sought to buy uniforms at a downtown store.

June 10—Fifty deputies and police used tear gas and riot clubs to run a food truck through a strike picket line at Republic Steel Corp.'s plant near downtown Youngstown. Two police were beaten, a bystander was shot in the leg and 15 pickets, suffering from gas, were jailed.

June 11—Mayor Lionel Evans was granted full power by Youngstown's city council to buy arms and hire special police. The SWOC announced it had appealed for every member to contribute one day's pay (approximately \$2,800,000 if each of the 400,000 members claimed by the union answered the appeal) to give strike benefits to needy workers. The Pennsylvania Railroad moved in 75 police to prevent tearing up of tracks by strike sympathizers. Mr. Girdler declared "scores of men are daily returning to the plants now operating, swimming rivers under fire, crashing picket lines in automobiles and on foot where civil authority has broken down."

June 12—Youngstown's Central Labor Union (Mahoning Labor Congress) threatened to call a general walkout of its 20,000 members if Mayor Lionel Evans and Sheriff

Ralph Elser did not give up their alleged strike-breaking activities.

June 13—Republic Steel said that pipe shipments had been resumed, that 21 cars of ore had been taken to its Youngstown blast furnaces, and offered \$500 reward for information convicting anyone threatening families of workers in the Niles and Warren plants which the company still is operating in part. A committee of the American Civil Liberties Union made public a report criticizing Sheriff Elser and city authorities for strike-breaking preparations and warned the authorities "armies will inevitably cause much violence and possible fatal injuries." The Youngstown *Vindicator*, Youngstown's only newspaper, said that "the steel companies will do well to sign" the SWOC agreement (the sole issue in the strike). The Central Labor Union took no action on a general strike but authorized an executive committee to "act in any way to protect labor's rights."

June 14—Former Prosecuting Attorney Ray Thomas of Mahoning County, acting as attorney for Sheet & Tube back-to-work groups, declared 9000 of 12,000 Sheet & Tube Campbell plant workers had signed back-to-work petitions and were "near the violence stage." He warned the company would be asked in a day or so to reopen its mills and advised the authorities to clear the mill gates of picket lines.

June 15—Sheet & Tube and Republic officials returned to Columbus to attend Governor Davey's peace meeting with a quick breakdown of negotiations forecast by those closest to the situation. The back-to-work groups were prepared to demand reopening the mills at the conclusion of the Governor's meeting, attended by Philip Murray, and steel executives.

Back-to-Work Movement

During the week both the involved steel companies and the SWOC issued statements intended chiefly to form public opinion for or against the strike but most comment came from public officials. A new letter to Sheet & Tube employees from that concern's management was being prepared for mailing midweek.

The first expression of sentiment from the back-to-work groups, emphasizing that an attempt to smash the strike was not far off, came from Attorney Thomas. His statement, outlining the attitude of workers made idle by the SWOC-steel company controversy over signing of a labor contract, follows:

"Nine thousand employees of Youngstown Sheet & Tube Co.

have signed petitions stating that they want to work and they are determined not to wait much longer.

"We neither approve nor disapprove of the company's action in refusing to sign a contract with the CIO. We acknowledge the right to ask a contract and the right to strike for a contract. We do not acknowledge that the strikers have the right to nullify by violence the right of other men to work.

"The men who have signed the petitions, including a number of men on the CIO picket lines, don't feel that there is any excuse for the position in which they now are. They have assumed the financial obligations involved in maintaining homes and families; the book of etiquette says nothing about what to do when the landlord tells them to get out, or when they receive notice that the water will be shut off. They have received no word that the gas company will continue service after bills remain unpaid, and they are old enough to believe that the electric light company will want money for the power it sells.

"These men, and there are closer to 10,000 than to 9000, who would go back to work tomorrow if they could, have no illusions. They know what this is all about. They need work, and they insist on going back to work.

"Up to this time I have advised them to keep themselves fully within the law and to exert every possible means of keeping out of trouble. But they are getting tired of seeing the bills pile up, with no income in sight to pay them.

"I want this public statement to be a warning to the company as well as to the CIO. These men have no criticism of those who differ with them and follow their personal convictions in a lawful manner, but these men do condemn professional agitators, who are not mill workers, and who are insincere in promoting trouble. They resent the actions of these professionals who never worked in a mill dictating to men who have lived in Youngstown all their lives as to what they can and cannot do.

"They resent the fact that a majority of the pickets are young men without responsibilities, that these irresponsible young men take it upon themselves in defiance of the civil authorities to intimidate and in many cases to attack law-abiding citizens who are proceeding in a lawful manner to secure the thing they most desire—an opportunity to return to their jobs.

"These young pickets are for the most part boys who have been influenced by speakers who have no interest in the community and are

Author of Wagner Act Says Law Does Not Compel Signing of Agreements

SENATOR ROBERT F. WAGNER of New York, author of the Wagner Labor Relations Act, in a letter to the New York *Sun* dated Nov. 2, 1935, and published on the editorial page of that newspaper on Nov. 4, 1935, declared in positive language that the law he sponsored does not compel the signing of agreements with a labor organization by an employer. Senator Wagner's letter is reproduced in full as follows:

TO THE EDITOR OF THE *SUN*:

A recent editorial article in *THE SUN* included the statement that the National Labor Relations Law, which I sponsored, required an employer "to sign an agreement compelling all workers in a plant unit to belong to a labor organization—when the organization is representative of a majority."

That statement is incorrect. The law does not require any employer to sign an agreement of any kind. Congress has no power to impose such a requirement. An agreement presupposes mutual consent. The law merely requires that an employer bargain collectively with his workers, which means that he shall receive their representatives and engage in a fair discussion in the hope that terms may be voluntarily agreed upon by both sides without recourse to strife.

The law does not under any circumstances require any employer to sign an agreement forcing any worker to join any union, whether it be a union representing the majority of his employees or not. On the contrary, it specifically makes it an unfair labor practice for an employer "by discrimination in regard to hire or tenure of employment, or any term or condition

of employment, to encourage or discourage membership in any labor organization." The law does permit a closed shop agreement, but only where it is voluntary on the part of both the employer and the majority of his employees. Voluntary closed shop agreements have long been in common use and upheld by the courts in many States of the Union including New York.

I am well aware that there are many who sincerely doubt the wisdom of this statute, although it does no more than to protect a right recognized repeatedly by Congress, as well as by common law courts, and not denied in principle by any one—the simple right of the working man to make a free choice of any union or of no union.

ROBERT F. WAGNER
U. S. Senate
Washington, Nov. 2, 1935

receiving pay for promoting the CIO. As attorney for non-striking employees of Sheet & Tube, I have advised these men that they have the same legal right to their jobs that strikers have to picket peacefully.

"They have the legal right to take adequate measures to protect themselves if they feel they are in imminent danger of bodily harm in connection with their work for the two organizations. I have likewise advised the civil authorities that they are responsible to the public for protecting life and property and that the courts have held here that the county is liable not only for damage to property but for death and injury if injuries are inflicted through the negligence of police power.

"As representative of the organizations of the Sheet & Tube employees, I expect to call upon officials of the company and acquaint them with the temper of the men who want to get back to work. So far not one act of violence has been the fault of any of the members of these two associations. This has come about not because the men have not been in a violent mood but

because I have advised them from the beginning to make every possible effort to keep out of trouble—to run from it if necessary.

"They cannot be expected to continue forever to sit idly by and twiddle their thumbs, jobless and payless, knowing that all that stands between them and their jobs are picket lines made up mostly of irresponsible boys.

"These men who want to get back to work acknowledge the right of CIO members to ask for a contract and their right to strike for it. But when the right to strike is used in such a way as to illegally deprive a majority of the men in the plants of their right to work, the men who want to work and who have a right to their jobs, can't be trusted forever to do nothing about it.

"These Sheet & Tube employees demand that from now on those who see things differently than they do shall conduct themselves with decency and in a lawful manner. The men who want to work are no longer going to put up with guerrilla tactics of the irresponsible young men who see things differently."

Wagner Criticizes Steel Companies

WASHINGTON, June 15. — While conceding, as he did in a letter to the New York *Sun* of Nov. 4, 1935, that the Wagner Act does not necessarily compel signed contracts, Senator Wagner, sponsor of the law, today assailed steel companies which have refused to sign written agreements with the CIO. He said that the steel companies are not acting in good faith.

"While the law does not compel agreements, refusal to sign in almost any instance shows bad faith, I believe," said Senator Wagner.

John S. Brookes, counsel for the Republic Steel Corp., declared that the law is absolutely silent on the question of whether employers are required to sign contracts. He added that in the opinion of most lawyers the act would be unconstitutional if it had specifically demanded that employers contract with employees.

Meanwhile John L. Lewis was said to be preparing to call a strike of Great Lakes maritime workers in an effort to tighten the steel

strike by shutting off iron ore shipments, a supplemental move to calling strikes at steel owned captive mines.

Put Verbal Agreements In Writing, Says President Roosevelt

WASHINGTON, June 15.—President Roosevelt today, when asked about the steel strike, said he hoped the situation will be straightened out. However he did not indicate that any specific plans for a settlement were being considered. He stated that Miss Perkins had told him that there were no new developments. When asked about refusal of steel companies to sign a contract, he said that one simple fact stands out quite outside the law. "Common sense dictates," the President said, "that if a company is willing to make an agreement verbally why shouldn't it put its name to it?"

Senator Robert F. Wagner reiterated the same opinion in a press interview the same day. "It seems to me," he said, "that when they refuse to sign—particularly after agreeing to terms the way the steel companies have—they are not bargaining in good faith. Failure to sign necessarily would make such an agreement unenforceable and subject to constant dispute."

Carboloy Blanks at Reduced Prices

CARBOLOY CO., INC., manufacturer of cemented carbide tools, dies, and wheel dressers, announce the development of three styles of standard Carboloy blanks available at reduced prices. The three styles in 96 sizes have been designed for wide application, based upon experience with thousands of carbide tool applications. They are adaptable for use on more than 90 per cent of all carbide tools in use.

In addition to the special price reduction on Carboloy standard blanks in any quantity, a special reduction has also been made on special blanks in quantities of 500 or over. Special blanks are all blanks other than the three standard styles.

The Carboloy Co. emphasizes that these are not general price reductions, but special reductions made possible through the quantity production. The base price of Carboloy remains at 45c. per gram.

Lewis Moves to Control Raw Materials As He Pours Vitriol on Steel Leaders

WASHINGTON, June 15.—Embittered at the stout resistance he has met to unionize independent steel companies, John L. Lewis has turned to new tactics and enlarged the scope of his already wide and unrestrained activities.

Not only is he making desperate efforts to enforce demands on companies which have been under attack by the Committee for Industrial Organization, but he is also extending his operations which clearly point to a purpose to embrace all the remaining units of the industry where his organization so far has not penetrated, thus seeking to take the entire industry in his grasp, including iron mines, Lake ore boats and scrap yards, covering the industry's essential raw materials.

Interestingly and perhaps significantly enough, the National Labor Relations Board has instituted a complaint which fits in completely with the Lewis strategy, proposing as it does to force the signing of union agreements. The NLRB complaint, directed against the Inland Steel Co., was suddenly announced late last Saturday. Disregarding union hours, Lewis, with the NLRB complaint issued to his liking, called a press conference Sun-

day. In his usual violent language he assailed independent steel companies, pictured conspiracies, as is his wont, and in resounding tones, made known new and broadened activities.

His new strategy was to call a strike of 9500 coal miners, members of his United Mine Workers Union, at 17 mines of the Bethlehem Steel Corp. and the Youngstown Sheet & Tube Co. The mines are located in central and western Pennsylvania and northern West Virginia. The purpose is to close Bethlehem and Sheet & Tube plants by calling off coal supplies. The UMW in the captive mines do not have contracts with the steel companies. Lewis has notified commercial coal companies having UMW contracts that any attempt to fill orders of the steel companies "will be resisted by the UMW, and members of the UMW will not load that tonnage."

Dragging the Bethlehem Steel Corp. further into the strike turmoil during the past week, Lewis said that agreement has been reached between SWOC strikers and 350 railroad strikers, members of two railroad brotherhoods on the Cone-maugh & Black Lick Railroad, owned by Bethlehem and which serves its plant at Johnstown, that neither will settle with the management until both receive agreeable terms.

That immediate extension of the campaign has been decided upon was made evident when Lewis dragged out his shopworn charge of financial-industrial agreement, in which he brought another company, the National Steel Corp., in the dispute, implying it would soon be added to the list of SWOC objectives. Lewis said the financial-industrial "combine" included Bethlehem, Republic, Sheet & Tube, and National Steel. Heading this combine, Lewis went on to say, were Chairman Eugene G. Grace of Bethlehem and William C. Potter of the Guaranty Trust Co.

Lewis reserved his most potent verbal vitriol for Chairman Tom M. Girdler of Republic, who he said should be brought to a "public accounting." Mr. Grace, gravely said Mr. Lewis, is the "power behind Girdler." And "Potter and Grace should be called to a public accounting," Lewis said.

Lewis said he wanted the same agreement—a signed agreement—with the independent steel companies as he has with 139 steel companies.

SHEET & TUBE WORKER TELLS CONGRESS THAT MINORITY VOTED STRIKE

"I TOOK the last dollar out of the house to get here because I thought this committee ought to know about conditions in the Valley."

In these words Bernard Wittenaner, Hubbard, Ohio, explained his presence Monday before the joint Senate-House Committee on Labor, which is considering wage-hour legislation, to indicate how non-union steel workers feel about strikes. Wittenaner is employed by the Youngstown Sheet & Tube Co., and complained bitterly that he and thousands of others have been thrown out of work by the strike. The strike, he said, had been voted "by only 500."

He told the committee that he was satisfied with working conditions and had declined to join the union. Wittenaner told the committee that the company affords employees recreation facilities, made loans at low rates of interest and permitted employees to buy goods at the company store.

Monroe Mill of Republic Steel Again Operating as Mob Violence is Quelled

CLEVELAND, June 14.—Interest in the steel strike deadlock, affecting three leading independents, and now partially involving a fourth company, Bethlehem Steel Corp., focused last week on Monroe, Mich., town of 20,000 inhabitants and site of Republic Steel Corp.'s subsidiary plant, the Newton Steel Co.

A protest meeting staged yesterday by CIO organizers drew thousands of union members to Monroe's Lakeside Park, three miles outside the city, to hear speakers denounce the breaking of the picket line at the Newton plant and "promise to come back in two days" unless unmolested picketing could be resumed. This challenge was flung by Van A. Bittner, Chicago regional director of the SWOC, who, with Homer Martin, president of the UAWA, attended the gathering as a principal speaker.

The mass meeting at Monroe yesterday grew out of resentment among automobile workers, allied with the CIO, in Pontiac, Mich., 70 miles to the north. There, heads of the local automobile workers union, upon hearing of events in Monroe, announced plans to call a "labor holiday" for all Pontiac workers, approximately 18,000 strong, and to advance on Monroe in automobile squadrons to protest the reopening of the local steel plant against strikers' resistance.

The "labor holiday" failed to materialize, but unionists from Indiana, Ohio, and Michigan converged on Monroe at the appointed time. Fearing violence, Governor Murphy dispatched National Guardsmen and State troopers to the community as a protection. Highway traffic was shunted to roads leading around the town and other precautions taken to insure that agitators should create no disturbance, leading to outbreak of serious violence.

The day passed without conflict, and the meeting in Lakeside Park disbanded.

Cause of the demonstration occurred three days before when 300 special deputies, supplemented by "loyal" workers, clashed with 200 pickets guarding the entrance to the Newton Steel plant and succeeded in breaking through. Work at the mill started up again. Pickets were routed, some were arrested and others driven out of town. Tear gas bombs, bricks, clubs and baseball bats were used in the fighting, which lasted about half an hour.

The order to return the men to work was issued by Monroe's mayor following a ballot taken to determine majority opinion. It was claimed that of those who voted, 856 employees were in favor of returning against only 20 who were opposed.

While this dissension occupied Monroe, hostilities were under way at Youngstown. (Details elsewhere in this issue.)

In Canton, Ohio, a general strike loomed, however, as executive committees of all affiliated unions of the Canton Federation of Labor voted unanimously to put 15,000 members on strike if the Canton Citizens' Law and Order League makes any attempt to break the

Ore Shipments Not Cut Down by Strike

SHIPMENTS of ore from the Lake Superior district have not been affected by the closing down of steel plants by strikes. Several mines that supply ore for steel plants that have suspended operations have been shut down, this being the only effect that the strike has had upon the ore mining industry.

Lake vessel interests have diverted their boats to the movement of ore to steel plants that are under normal operations. Ordinarily, if ore shipments were held up by a steel plant, the boats hauling the cargoes would be unable to find other cargoes and would have to be tied up. However, this year, with the expectation of an ore movement that will reach and may exceed former records, the demand for vessel capacity is in excess of the supply and steel plants not interrupted by strikes are glad to supplement their vessel capacity with other boats that otherwise would be temporarily idle.

Boats that have been diverted from their usual channels are now bringing down cargoes for U. S. Steel, Bethlehem Steel Co., and Jones & Laughlin Steel Corp. Included are Inland Steel Co. boats which are now bringing iron ore to Lake Erie ports. Steel plants affected by strikes cannot place a great deal of ore in the stock piles at Lake Erie ports, as each company is limited to the dock space that is allocated to it for dock ore.

picket lines at plants of Republic Steel there. A league spokesman replied that agency would go ahead with its plans to enlist the aid of citizens in helping the police of Canton "insure peaceful picketing."

A poll of opinion among workers in Canton last week, conducted by the Chamber of Commerce, revealed that 3633 employees wanted to return to work against 216 who were opposed.

In Federal Court, the motion brought by CIO to dismiss the injunction suit asked by three railroads against the steel unions' interference with operations was over-ruled, and hearing on the case postponed.

The case of Robert W. Northrup, stockholder, against Republic for alleged illicit purchases of guns and ammunition used in combating strikes reached a preliminary hearing. The corporation's request that the case be dismissed was refused.

Organizers for the CIO are making some attempt to induce the seamen on the Lake boats to join their ranks with the evident purpose of being in position to endeavor to tie up Lake traffic, but it is doubtful whether they will be able to make much headway in that direction.

Merchant Marine Program for 95 Ships

WASHINGTON, June 15.—The Administration proposal for a \$160,000,000 merchant shipbuilding program provides for 95 ships, according to Chairman Joseph P. Kennedy of the United States Maritime Commission. They would include a super-liner of the Manhattan-Washington type, 60 cargo ships, 24 passenger-cargo ships and 10 high-speed tankers. The President asked Congress to authorize an immediate appropriation of \$10,000,000 for the commission, and an appropriation of \$150,000,000 to be expended before 1940.

THE artist's sketch of the completed 200-in. telescope, as it will appear after installation at Mt. Palomar, Cal., reproduced on page 33 of the June 10 issue of THE IRON AGE, is the work of R. W. Porter, whose signature on the reproduced drawing was not legible.

Republic Steel Sues Farley To Compel Delivery of Mail to Plants

WASHINGTON, June 15.—Court action to compel resumption of parcel post mail service at the strike-bound plants of the Republic Steel Corp. at Warren and Niles, Ohio, was instituted here today. The Republic company, through its counsel, John S. Brookes, Jr., filed a suit in the District Court of the United States for the District of Columbia for a writ of mandamus directing the Postmaster General to withdraw unofficial promulgation with respect to "irregular mail" and to instruct the postmasters at Warren and Niles to accept parcel post packages for delivery at the company plants in those cities.

"Having waited a week for a reply to our letter of June 8, to Mr. Farley, and having received none, we have no recourse but to resort to such legal action as is available to us under the circumstances involved, said Mr. Brookes.

"We have accordingly filed today in the District Court of the United States for the District of Columbia, a petition for a writ of mandamus to compel the Postmaster General to issue to local postmasters orders necessary to insure delivery through the mails to the people working in our plants of all matter which is properly mailable under the terms of existing Federal postal laws and regulations.

"This, of course, means food and other articles, such as newspapers, which have thus far been denied admission to the mails or have not been delivered after having been accepted into the mails.

"In order to cover the situation as thoroughly as possible, we intend within the next few days to file separate actions directed against the local postmasters involved. These actions will, of course, be filed in a court having jurisdiction to entertain them."

Fisher Body Closes Cleveland Plant

CLEVELAND, June 15.—The Fisher Body plant of General Motors Corp. here is closing down tomorrow morning for an indefinite period due to labor troubles at other plants which have caused a shortage of material. The plant here is not on strike, but a spokesman says a general move for industry to shut down pending the outcome of the present strike wave is likely to occur. It is understood that other voluntary shutdowns in the Chevrolet division are scheduled.

Republic Explains Stand To Its Employees

CLEVELAND, June 15.—The Republic Steel Corp. late today issued a printed statement addressed to its employees reiterating its determination not to sign a union contract. The statement advised: "If you will dig below the surface, you will see that the issues involved in this controversy are far deeper than simply whether officials of Republic will or will not put their names on a piece of paper." Reference was to the closed shop and the check-off.

The statement mentioned loss in wages to its employees of \$3,000,000 since the strike and accused

the CIO of irresponsibility. It asked, "would you yourself sign a contract with a man who clubs his neighbor over the head, kicks the postman out of your yard, throws bricks through your parlor window, and has already broken a contract with the man across the street." Also, "must Republic and its men submit to the communistic dictates and terrorism of the CIO. If America is to remain a free country, the answer is no!" The statement was signed by Tom M. Girdler, chairman.

T. M. Girdler Answers Senator Guffey

TOM M. Girdler, chairman of Republic Steel Corp., issued the following statement on June 11:

"When Senator Joe Guffey of Pennsylvania rises in the Senate to attack the Republic Steel Corp. for not signing a contract with the CIO, he not only condones the reign of lawlessness now being carried on by the Lewis union in many communities throughout the country, but he brushes aside as of no consequence the many thousands of our employees who are opposed to such a contract.

"I offer for Senator Guffey's consideration a few figures. More than 23,000 of our employees are at work today. They did not heed the strike call. They remained in the plants of their own free will. They believed that as American citizens

they were free to work if they so chose.

"Many of these men are in besieged plants surrounded by mobs of armed and menacing pickets, most of whom have never worked for Republic. Despite the picket lines, scores of men are daily returning to the plants now operating, swimming rivers under fire, crashing picket lines in auto and on foot, where civil authority has broken down.

"In addition to the men in the plants, many thousands more want to return to work. They either are opposed to the aims of the CIO or they are indifferent to them. They want to be allowed to work unmolested.

"Based on a careful study of impartial polls taken in various communities, and petitions circulated by employees who want plants opened, we know that in addition to the 23,000 men now at work many more thousands are opposed to the CIO. These polls and petitions are available.

"The men at work and the men who want to go back to work, if they were permitted, constitute a large majority of our employees.

"Yesterday (June 10) a committee of workmen, claiming to represent the majority of our employees, called at my office and formally notified me that if Republic signed a contract with the CIO they would immediately call a new strike in protest.

"Does Senator Guffey think that the majority of our men should have no voice in this matter?

"The overwhelming vote by employees to return to work in the election held under the auspices of the city authorities in Monroe is merely an indication of the tide of sentiment rapidly rising throughout all our plant communities against CIO activities.

"Our men know that no question of hours or wages are involved.

"Our employees know that the real issue of the strike is not the mere refusal to sign a contract, but that such a contract, by admission of CIO officials themselves, is but the first step toward a closed shop and the check-off. In other words' before getting a job a man must first have a card bearing the John Lewis O. K.

"They know that the security of their jobs does not rest on a CIO contract but upon the continuance of prosperous conditions, which are being threatened by the wave of strikes and lawlessness engendered by the CIO at a cost of billions of dollars in lost wages and industrial production. In Republic alone this strike has caused the loss in wages to employees to date of \$2,600,000."



MANY prominent engineers attended the Machine Tool Speed Show held by the General Electric Co. May 24 at Cincinnati, a prominent machine tool building center. Sol Einstein, vice-president, Cincinnati Milling Machine Co., is in the foreground at the left. At his right is G. J. Clark, General Electric Co., Toledo, and behind him is George Temple, Baker Bros., Inc., Toledo. S. W. Corbin, manager of sales, machinery manufacturers section, Industrial Department, General Electric Co., is at Mr. Einstein's left. Standing (at right) are E. A. Muller, president, King Machine Tool Co., Cincinnati, and H. M. Lucas, president, Lucas Machine Tool Co., Cleveland.



Further Standardization of Electric Equipment Held Desirable

WHILE it is realized that existing power plants and equipment make such standardization difficult, steps toward a general standardization of current characteristics of motors in the future is very desirable, said Sol Einstein, vice-president and chief engineer, Cincinnati Milling Machine Co., in addressing the Machine Tool Speed Show, held recently by the General Electric Co., at the Hotel Gibson, Cincinnati.

"Electric current of the d-c and a-c type is used in this country indiscriminately and the variance in voltage from 110 to 440 volts necessitates individual motors to suit the current characteristics of the individual customer," Mr. Einstein continued. "Variance in phase characteristics of the current simply adds to these difficulties. Thus, we find that machine tools of the so-called built-in type can only be finished after the individual order is obtained by the manufacturer and he knows the current characteristics prevailing in the customer's shop. This results in individual orders of electric motors from the motor manufacturer, instead of the quantity buying which certainly would be advantageous to the electric-motor manufacturer and which would save delay and additional expense to the machine-tool builder and his customer. Some European countries have accomplished standard-

ization in a relatively short time and they enjoy the benefits of simplification of electric-motor equipment."

Wide Variety of Control Equipment

"Another problem of considerable magnitude is the great variety in size and style of control equipment catalogued today by electrical manufacturers. It seems natural that when it was possible to standardize the frames of motors it would also be possible to standardize control equipment, particularly such equipment as is commonly used in machine-tool applications. For the same capacity and purpose, this starter and control equipment varies considerably in dimensions and designs. Even such simple devices as push-button control boxes vary dimensionally to a great extent. Quite frequently today, starting and other control equipment is employed in machine tools without the inclosing cases, being mounted in compartments in the machines to avoid obstructions on the outside of the main frame and to give the machine a neater appearance. With the omission of such inclosing cases on control equipment, considerable annoyance is experienced by machine-tool manufacturers, as well as by the users of the equipment, since the maker's name appears generally only on the outside of the case.

"And finally, the wiring itself is of considerable annoyance to the machine-tool builder. This is due particularly to the fact that each shop has its own ideas and fancies, and wiring that might please one user might be definitely rejected by another. Standardization of this phase of electric equipment would be very desirable indeed."

In another part, Mr. Einstein pointed out that individual motor drive of machine tools has made great progress and is today practically universally used in new installations. Less than 1 per cent of the machine tools supplied his company use other than individual motor drives.

Wheeling Steel to Clear Up Arrears

WHEELING STEEL CORP. directors proposed a plan to clear dividend arrears on preferred stock providing for exchange of one share new \$5 cumulative, convertible prior preferred, and one-half share common for each share of the present six per cent preferred. Authorized common would be increased to 1,500,000 shares from 500,000 with 190,723 shares required if all six per cent preferred is exchanged, the balance of common to be held for conversion and other corporate purposes. Stockholders will vote on the plan July 14.

About 150 members of the American Association of Railroad Superintendents made an inspection trip through the rail mill of the Carnegie-Illinois Steel Corp. at Gary and viewed the recently installed Brunorizing furnace.

Bethlehem Operating Johnstown Plant Despite Strike; Coal Walkout Ordered

PITTSBURGH, June 15.—Attempting to carry their strike activities to a fourth large independent steel company which has refused to sign a union contract the Steel Workers Organizing Committee late last week called a "sympathy" strike at the Cambria works of the Bethlehem Steel Corp., Johnstown, Pa. The strike was supposed to bolster up a walkout of some employees of the Conemaugh & Black Lick Railroad, a Bethlehem company connecting line, who were attempting to force the company to sign an agreement with a railroad brotherhood. It is significant, however, that SWOC spokesmen a month ago threatened the company with a walkout if a steel contract were not signed in 10 days and now the union has extended the "sympathy" part of their demands to encompass a written agreement similar to what they are after from the other three independent steel companies.

Although the union claims a strength of 10,000 workers out of 15,000, at Johnstown, reliable but unofficial sources estimate the number of workmen actually on strike at 3000 or less. While the mill is not operating at capacity, all departments are working, as employees desiring to go into the mill have been able to get through the picket line. How long this situation will last is problematical in view of a few sporadic outbreaks which have occurred.

Coal Strike Ordered

The steel strike, which has now enmeshed Bethlehem Steel in addition to the three other leading independents, took another turn yesterday when John L. Lewis, CIO head, and power behind the organization drive, announced he had issued strike orders to 17 subsidiary coal mines owned by Bethlehem Steel and Youngstown Sheet & Tube Co. United Mine Workers employed in this group of mines were ordered out.

His orders to the United Mine Workers Union to have workers withdrawn from "captive" coal mines operated by Bethlehem and Youngstown Sheet & Tube affected 17 mines in Pennsylvania and northern West Virginia, employing 9500 men.

This action of Lewis drew from the Sheet & Tube Co.'s president, Frank Purnell, the following statement: "The statement of John L. Lewis to the effect that he has

closed the captive mines of the Youngstown Sheet & Tube Co. is ridiculous. Our coal mines were shut down by the company early last week. No miners have been working in these mines since that time."

Other actions of Lewis included establishment of a relationship

between the CIO and certain railroad brotherhoods affiliated with Bethlehem's Conemaugh & Black Lick Railroad, which staged a walkout in Johnstown, Pa., and resulted in a CIO strike call against the Cambria works.

Lewis charged that Eugene Grace, president of Bethlehem Steel, was the "power behind Girdler" in the latter's opposition to signing a contract. In his generally condemnatory statements, he also included William Chapman Potter, chairman of the Guaranty Trust Co. of New York, who was

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accused, together with Mr. Grace, of putting pressure on Mr. Girdler not to sign with the union.

Lukens Steel Signs N.L.R.B. Stipulation

WASHINGTON, June 15. — The National Labor Relations Board has announced that the Lukens Steel Co., Coatesville, Pa., has agreed to a stipulation requiring the company to withdraw recog-

nition from the Lukens Employee Representative Committees and Lukens Employee Association. The stipulation grew out of a complaint made by the Amalgamated Association of Iron and Steel Workers which alleged that Charles W. Brown, a crane operator at the Coatesville plant, had been discharged for union activity. Under the stipulation the board said Brown will be reinstated as of June 14 and will receive back pay covering his discharge amounting to \$565.60.

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Machinery Institute Opposes Wage Bill

WASHINGTON, June 11.—The Machinery and Allied Products Institute, through its president, John W. O'Leary, declares that the Black-Connery wage and hour bill is based upon economic principles which have been proved false by experience, and upon social controls which would endanger both economic and social progress. The statement was made at the joint hearings of the labor committees of the Senate and House.

"There is far greater danger to the general welfare of the American people in conferring upon any board such broad powers as are contemplated in this act than there is" in unregulated hours and wages," Mr. O'Leary declared. He urged, to avoid adopting legislation "which is capable of doing more harm than good," that more study be devoted to the subject.

"Let it be determined exactly how a measure which limits hours and prescribes wage rates can avoid leading to other measures which regulate prices, fix production quotas, and curtail the opportunities for individual initiative to improve the standard of living, as it has in the past," he said.

The institute filed with the committees a summary of its findings based on "experience with the NRA, economic and sociological research, and authoritative opinion." The brief was divided into two parts, one devoted to the economic aspects of the legislation and the other to the social aspects.

SWOC Wins Election At Pittsburgh Steel

THE Steel Workers Organizing Committee last week became exclusive bargaining agent for Pittsburgh Steel Co. employees at the Monessen and Allenport plants following their victory at a Government-supervised election by a vote of 5287 to 645 in favor of the SWOC. The tabulation of the votes by plants shows Allenport for SWOC 1751, against, 155; Monessen, for SWOC 3536, against, 490. The peaceful election marked the ending of a conflict of more than a year's standing between Pittsburgh Steel and the SWOC. Both management and the union recently agreed upon the election as a means of settling a one-day strike which occurred recently. As in the case of the Sharon Steel election, it is expected that a contract between Pittsburgh Steel and the SWOC will be signed in the near future.

N. Y. Scrap Dealers Sign Union Contract

A TWO-YEAR labor agreement for the New York scrap iron trade was signed June 11 between the New York chapter of the Institute of Scrap Iron and Steel, covering the city of New York, Long Island and Westchester County, and the Waste Material Sorters, Trimmers and Handlers Union, affiliated with the American Federation of Labor.

The agreement provides a 45-hr. week, consisting of five days of nine hours each. All work on Saturday, and beyond the 9 hr. standard day, will be paid for at the rate of one and one-third overtime. The minimum wage for yardmen is 45c. per hr. and for truck-drivers 65c. per hour. Workers who are now getting above the minimum are to have their wages adjusted upward by an equitable arrangement.

Other terms of the agreement provide for seniority rules in lay-offs; the establishment of a joint labor relations committee to hold hearings and arbitrate all disputes and complaints arising out of the terms of the agreement; all parties agree that there shall be no strikes, sit-downs or lock-outs during the life of the agreement; the agreement shall be effective for the period of two years, beginning on June 21, with the right on the part of the union to negotiate a revision of wages and hours at the end of the first year, with all disputes arising therefrom to be submitted to the National Labor Relations Board.

Organizing work among workers in scrap yards in other sections of the country is being actively carried on, in some places by the American Federation of Labor and in others by the Committee for Industrial Organization.

Labor Peace Achieved In U. S. Rubber Plant

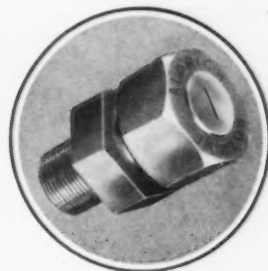
A SPECIAL chapter in the story of successful industrial relations and a discussion of automobile tire manufacturing were given by Montague A. Clark, manager of industrial relations for U. S. Rubber Products, Inc., who addressed the members of the Detroit chapter of the American Society of Tool Engineers at their monthly meeting June 10. More than 300 members and guests attended a dinner in the plant dining room and made an inspection trip

through the plant. Modern conditions for labor and improved methods of tire construction were credited by Mr. Clark to the work that has been done by the tool engineer.

Mr. Clark, well-known for his success in maintaining satisfactory relationships with labor in the U. S. Rubber Products plant, emphasized that never yet in the plant has there been a ripple on the surface of labor relations.

Through the pioneering and application of every possible engineering improvement, the company has maintained itself in the position of paying the highest wage rates and the highest weekly income in the mass production industries, while operating on a 36-hr. week, he said. The average, he claimed, is \$1.04 an hr. The plant operates on 6-hr. shifts, four each day, six days a week and because of the nature of operations, generally operates

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two Sundays a month. It employs 6000 workers and produces more than 12,000,000 tires a year, averaging 35,000 a day. Despite the fact that the rubber industry pays wages 19 per cent above the average, Mr. Clark said, it had improved its product and cut its cost so the tire price is less than one-quarter that charged early in the century, while performance in terms of tire miles is 100 times better. He urged industrial leaders to adopt practical social security plans of their own accord and out-

lined his firm's philosophy of "taking people into the organization" rather than hiring and firing. He explained in detail the company's

employment policy, apprenticeship plan, medical examinations, sick benefits and group insurance and the retirement and savings plan.

Republic Resumes Work in Wire Mill; Acme Steel Workers Vote for CIO

CHICAGO, June 14.—Peace and quiet has ruled this week at the Chicago district's strike-beset steel mills. At the South Chicago plant of Republic Steel Corp., scene of the Memorial Day riot, the situation has so eased that this morning the women office workers returned to their posts for the first time since the difficulties began.

The general position of all three of the affected plants, Inland Steel Co., Youngstown Sheet & Tube Co., and Republic, is unchanged from their announced stand at the outset. They do not intend to sign a contract with the C.I.O. A hearing on this question will be held June 25 in Chicago by the National Labor Relations Board, with the SWOC as the complainant and Inland Steel Co. as respondent. Inland is charged by the union with having acted in bad faith by refusing to sign a contract covering collective bargaining in spite of the statement made by J. H. Walsh, works manager, that the company is willing to meet with the union, but merely did not "propose to make a signed contract."

At Riverdale, Ill., workers at the Acme Steel Co., last week voted 1113 to 877 in favor of the CIO in a Labor Board election. Van A. Bittner, Chicago SWOC chief, has already communicated with company, according to R. H. Norton, president, asking for a meeting relative to the signing of a contract. Although Mr. Norton did not wish to state definitely what the company's future action might be, he made the comment that the Wagner Act does not require the signing of any contract.

Republic's new wire mill, closed down for housing purposes since the strike began, was in operation again today, the workers continuing to sleep in the Pullman cars within the plant. The rerolling mill at Republic's Sylvan Island plant at Moline, Ill., was closed over the week-end by a strike. About 200 men were affected.

In nearby Rockford, Ill., the CIO is reported to be harassing the plants of machine tool builders, and the J. I. Case Co. plant there employing over 1200 men has been closed down since June 11 by a

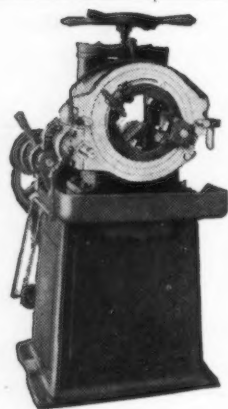
strike, and even company officials are being denied entrance to the premises. The union is demanding a 25 per cent wage increase and a signed contract. The company has made three upward adjustments in wages since Dec. 1, 1936, and is now offering a 58c. minimum for hourly workers, a 5c. an hour increase, and a 10 per cent increase for those on piece work.

Welding Awards Open to Wide Field

FURTHER clarification of the object of the \$200,000 series of awards established by the James F. Lincoln Arc Welding Foundation, Cleveland, has been made in a recent statement by Dr. E. E. Dreese, chairman of the foundation's board of trustees and of its jury of awards. Details of the competition, which involves 446 separate prizes for papers dealing with arc welding as a primary process of manufacture, fabrication or construction in 11 major divisions of industry, were given in THE IRON AGE of Feb. 4, page 93.

"The idea that the opportunities of the Lincoln Foundation's awards are available only to individuals familiar with electric welding and its use is erroneous," states Dr. Dreese. "Although a definite object of the awards is to urge architects, engineers, designers and production managers to study products which are now partially welded so that electric welding may be applied more extensively, the primary object is to encourage study of products and structures built by some other method so that electric welding may be used in construction."

"Ample time is allowed by the duration of the Foundation's award program—closing June 1, 1938—to permit engineers to acquire sufficient knowledge of the principles of arc welded construction to apply the method in product or structure redesign. To be suitable as subject matter for a paper, it is not necessary that the product or structure be built entirely by arc welding."



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Imports (In Gross Tons)

	April		Four Months Ended April	
	1937	1936	1937	1936
Pig iron	11,469	11,982	45,963	65,418
Sponge iron .....	.....	306	1,455	1,128
Ferromanganese ¹	3,379	1,671	11,407	7,172
Spiegeleisen	1,240	2,740	5,850	7,500
Ferrochrome ²	34	.....	159	1
Ferrosilicon ³	192	86	467	308
Other ferroalloys ⁴ .....	.....	.....	52	.....
Scrap	11,713	8,549	18,512	30,817
Pig iron, ferroalloys and scrap	28,027	25,334	83,865	112,344
Steel ingots, blooms, etc. ....	.....	19	124	61
Billets, whether solid or hollow	220	64	676	232
Wire rods	1,751	1,597	5,982	6,802
Semi-finished steel	1,971	1,680	6,782	7,095
Concrete reinforcement bars	586	202	2,639	526
Hollow steel bars	254	185	872	654
Merchant steel bars	6,891	3,302	20,888	12,726
Iron slabs .....	.....	.....	1	.....
Iron bars	410	35	832	423
Boiler and other plate	137	.....	176	52
Sheets, skelp and saw plate	1,603	2,180	5,635	7,594
Die blocks or blanks, etc.	18	80	53	88
Tin plate	12	30	71	89
Structural shapes	10,716	5,056	34,047	17,324
Sheet piling .....	.....	249	854	776
Rails and track material	765	1,720	3,269	2,571
Welded pipe	2,053	458	3,861	1,831
Other pipe	4,378	1,221	8,462	6,226
Cotton ties .....	.....	29	349	88
Other hoops and bands	3,426	2,681	10,560	7,564
Barbed wire	1,746	1,439	5,548	7,593
Round iron and steel wire	581	233	1,954	1,436
Telegraph and telephone wire .....	.....	5	8	32
Flat wire and steel strips	300	259	1,139	943
Wire rope and strand	396	257	1,154	883
Other wire	252	138	1,219	554
Nails, tacks and staples	2,686	2,337	7,552	9,729
Bolts, nuts and rivets	23	36	230	139
Horse and mule shoes	35	35	87	123
Rolled and finished steel	37,268	22,167	111,460	79,961
Malleable iron pipe fittings	71	6	160	17
Cast iron pipe and fittings	221	30	928	62
Castings and forgings	639	60	1,498	362
Total	68,197	49,277	204,693	199,844

¹ Manganese Content. ² Chrome Content. ³ Silicon Content. ⁴ Alloy Content.

Exports (In Gross Tons)

	April		Four Months Ended April	
	1937	1936	1937	1936
Pig iron	38,177	215	83,059	712
Ferromanganese and spiegeleisen	1,076	142	1,226	150
Other ferroalloys	60	280	621	810
Scrap, iron and steel	421,383	190,845	989,443	645,304
Scrap, tin plate	2,827	2,507	9,765	8,825
Waste-waste tin plate	3,676	3,554	15,047	9,287
Pig iron, ferroalloys and scrap	467,199	197,543	1,099,161	665,088
Ingots, blooms, billets, sheet bars	5,216	2,841	17,371	4,219
Ingots, etc., alloy steel incl. stainless	279	.....	911	.....
Skelp	11,181	3,901	21,453	7,157
Wire rods	6,508	4,664	14,524	14,431
Semi-finished steel	23,184	11,406	54,259	25,807
Bars, plain and reinforcing	12,066	4,944	33,665	16,970
Bars, alloy steel	616	.....	2,046	.....
Bars, stainless steel	7	.....	73	.....
Iron bars	114	170	577	441
Plates, plain and fabricated	30,425	6,889	79,880	20,398
Plates, alloy steel	1,104	.....	1,311	.....
Plates, stainless .....	.....	.....	11	.....
Sheets, galvanized steel	7,261	5,464	21,932	18,936
Sheets, galvanized iron	437	58	2,056	352
Sheets, black, plain steel	29,220	12,250	73,942	44,910
Sheets, alloy steel	60	.....	141	.....
Sheets, stainless	47	.....	186	.....
Sheets, black iron	1,238	518	3,045	2,492
Hoops, bands, strips, plain steel	6,611	5,289	29,853	19,214
Hoops, bands, strip steel, alloy	57	.....	477	.....
Hoops, bands, strip steel, stainless	81	.....	235	.....
Tin plate and taggers' tin	30,389	24,886	98,037	79,221
Terne plate (including long terne)	378	267	2,277	1,096
Structural shapes, plain material	12,179	5,282	39,404	16,350
Structural material, fabricated	2,117	2,331	11,040	6,652
Sheet piling	127	167	1,875	1,020
Tanks, steel	2,543	2,168	8,834	9,671
Steel rails	10,340	4,996	37,785	21,507
Rail fastenings, switches, spikes, etc.	1,996	934	5,063	3,409
Boiler tubes	904	755	3,862	2,090
Casing and oil line pipe	7,763	2,072	33,401	7,273
Pipe, black and galv., welded steel	3,120	1,075	12,521	6,589
Pipe, black and galv., welded iron	334	318	1,349	1,081
Plain and galvanized wire	4,041	3,288	18,174	13,787
Barbed wire and woven wire products	3,585	3,304	14,246	10,696
Wire rope and other products	1,378	737	4,649	2,799
Nails and tacks	2,386	1,216	8,787	3,853
Bolts, nuts, rivets and washers, except track	1,005	561	3,600	2,010
Rolled and finished steel	314	177	928	630
Cast iron pipe and fittings	174,113	90,116	555,262	313,417
Malleable iron screwed fittings	3,250	1,176	12,318	4,379
Car wheels and axles	411	325	1,424	985
Castings, iron and steel	1,597	379	5,173	1,734
Castings, alloy steel, incl. stainless	1,191	719	4,700	3,660
Forgings, plain	190	.....	561	.....
Forgings, alloy steel, incl. stainless	552	323	1,877	1,664
Castings and forgings	29	.....	274	.....
Total	671,746	301,987	1,735,009	1,016,764

April Exports Topped Any Month in 1929

EXPORTS of semi-finished and finished iron and steel from the United States in April, according to information released by the metals and minerals division, Bureau of Foreign and Domestic Commerce, soared to new heights when the volume of 243,800 gross tons, valued at \$15,854,933, not only topped shipments in any month of 1929, but also surpassed the monthly totals for the previous eight years of comparable record.

Pig iron exports present an outstanding feature of the current year's trade, the unprecedented total of 83,059 tons having been shipped in the first four months. In April, it was the leading product shipped on a tonnage basis, the total reaching 38,179 tons against 23,384 in the previous month and 215 tons in April, 1936. Next in importance was tin plate, the leader from a value standpoint, with a total of 30,289 tons against 23,484 tons in March. April shipments of scrap reached the huge total of 427,886 tons, valued at \$8,340,759 and surpassed the March figure of 362,249 tons, valued at \$6,735,381, which in themselves represented the peak monthly level of scrap shipments.

United States Imports of Pig Iron by Countries of Origin

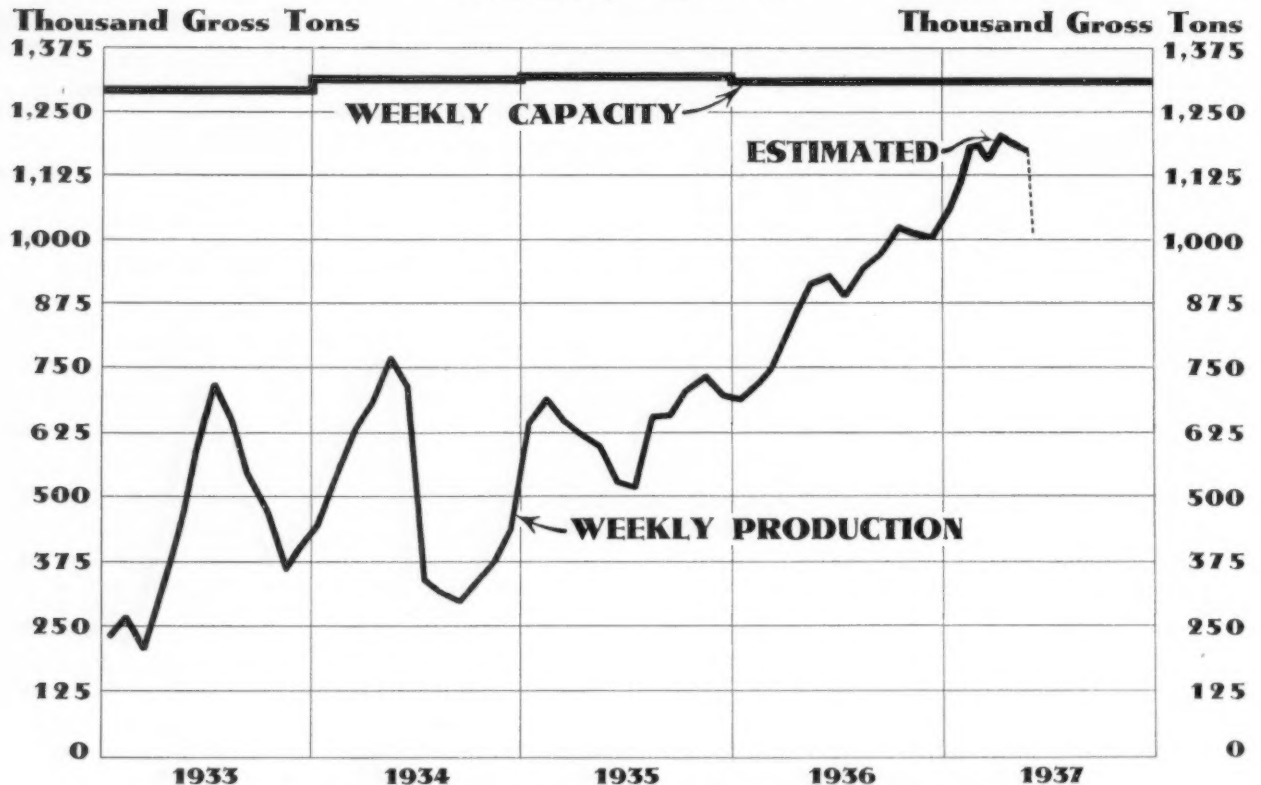
	April		Four Months Ended April	
	1937	1936	1937	1936
United Kingdom .....	.....	.....	50	1,082
British India	7,791	4,765	23,600	17,957
Germany	100	160	410	2,695
Netherlands	2,960	1,557	13,524	29,078
Canada	318	1,058	3,023	2,193
France .....	.....	.....	.....	529
Belgium .....	.....	.....	.....	375
Norway	100	51	375	1,058
Sweden	200	.....	400	164
Russia	4,191	4,581	10,462	.....
All others	200	.....	200	.....
Total	11,469	11,982	45,963	65,418

April Imports of Iron and Manganese Ores

	April		Four Months Ended April	
	1937	1936	1937	1936
Canada	90	.....	.....	.....
Cuba	55,000	34,000	3,150	.....
Chile	110,350	109,850	.....	.....
Spain .....	.....	148	.....	.....
Norway	31,121	22,245	.....	.....
Sweden .....	.....	.....	.....	.....
French Africa .....	.....	.....	.....	.....
Russia .....	.....	.....	22,281	4,869
India .....	.....	.....	780	2,113
Brazil .....	.....	.....	.....	811
Gold Coast .....	.....	.....	16,515	10,716
Other countries	492	10,428	124	60
Total	197,053	176,671	42,850	18,569

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1937



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	Current Week	Last Week
Pittsburgh	*93.0	93.0
Chicago	64.0	63.0
Valleys	44.0	45.0
Philadelphia	69.0	69.0
Cleveland	56.0	56.0
Buffalo	95.5	95.5
Wheeling	100.0	100.0
Southern	71.5	78.5
Ohio River	92.5	95.5
Western	95.0	95.0
St. Louis	93.0	93.0
Detroit	100.0	100.0
Eastern	70.0	70.0
Aggregate	77.0	78.0

* No data on Johnstown operations.

Weekly Booking of Construction Steel

	June 15, 1937	June 8, 1937	Week Ended May 18, 1937	June 16, 1936	Year to Date 1937	Year to Date 1936
Fabricated structural steel awards.....	15,600	24,650	16,700	25,410	569,165	491,210
Fabricated plate awards.....	195	0	320	2,960	58,210	138,115
Steel sheet piling awards.....	430	0	0	0	31,735	17,765
Reinforcing bar awards.....	5,150	7,300	1,410	1,140	105,685	165,985
Total Lettings of Construction Steel...	21,375	31,950	18,430	29,510	764,795	813,075

...SUMMARY OF THE WEEK...

... Steel markets not yet materially affected by strikes.

o o o

... Ingot output for country as a whole slightly lower despite some gains.

o o o

... Closing of coal mines a futile gesture so far as immediate effect is concerned.

WITH CIO strikes now extended to four major independent steel companies, together with a walkout of miners at "captive" coal mines owned by the involved companies, the Lewis union forces are trying to get their grip on the raw materials used by the steel industry through the organizing of workers in Lake Superior iron mines, on Great Lakes ore boats and in scrap yards.

The threat of a strike on Great Lakes boats, thus tying up shipments of ore to companies with which the CIO is in dispute, is an empty one at the moment, because these companies are unable to handle all of the ore that is consigned to them and are shifting cargoes and boats to other steel producers. Aggregate water movement of Lake Superior ore has thus far not been affected.

So far as its immediate effect on the steel companies is concerned, the closing down of "captive" mines is a futile gesture, because the steel plants have ample stocks of coal for some weeks; in fact, Republic Steel and Youngstown Sheet & Tube had closed down their mines prior to the calling of the "strike" because of excess stocks. The principal effect on the market of the coal shutdown is pressure for quicker shipments of pig iron by some foundry consumers.

CLOSING of the coal mines denotes a desperate attempt by CIO Leader Lewis to offset the setbacks the union is receiving at other points. The opening of the Republic mill at Monroe, Mich., following the attainment of law and order; the starting up of Republic's wire mill at Chicago, which had been used to house workers; the success of the Bethlehem Steel Corp. in preventing more than a partial crippling of its operations at Johnstown, Pa., and a growing back-to-work movement among non-union employees of mills at Youngstown are signs that point to the eventual breaking of the strike. The back-to-work move-

ment has reached a point where steel companies are having difficulty in restraining their loyal workers from taking matters into their own hands and forcing resumption of steel manufacturing in closed plants.

With June 25 set as the date for the hearing of the National Labor Relations Board's complaint against the Inland Steel Co., a decision is expected from that board on the pivotal issue in the strikes—the signing of agreements with the CIO unions. In the interim no action that would savor of intervention by the Federal Administration is expected, although its sympathies are outspokenly in favor of the CIO.

IN the steel markets the strikes are having a minimum of influence. New business in Pittsburgh and at one or two other points was slightly larger in the past week than in the week before, indicating some diversion of orders from strike-affected companies to those not involved, but the small amount of such switching of business indicates that the majority of steel users are well supplied for the time being. A more noticeable effect of the strikes is an increase in specifications against contracts, particularly from consumers who have two or more regular sources of supply, one or two of which may be unable to ship because of strikes.

One of the most serious results of the strikes, as affecting consumers, is the loss of tin plate production, which totals about 30,000 tons a month, or approximately 17 per cent of the average monthly output in 1936. Owing to the close proximity of the packing season, this tonnage cannot be made up this year. There is an ample supply of cans for early crops, but, should the strikes last for some weeks longer, there might be a shortage of tin plate for late season crops. As weather conditions promise bountiful harvests, considerable farm produce might go to waste in such a situation. With full and uninterrupted production, it was apparent some weeks ago that 1937 output of tin plate would be no more than enough to take care of the year's exceptional requirements.

PRODUCTION of steel ingots is slightly lower this week, according to our estimate—77 per cent against 78 per cent last week—this being partly due to reduced output at Johnstown, Pa., and in the Youngstown area, where there are strikes, and in the South, where there are no strikes. In the Chicago district, where the Inland plant is closed tight, the average rate is up one point to 64 per cent because of increased output by Republic and Carnegie-Illinois.

Steel scrap continues to reflect strike conditions, with further declines of 50c. a ton at Pittsburgh and Philadelphia, but no change at Chicago. THE IRON AGE scrap composite price is at a new low for the year of \$17.08.



...PITTSBURGH...

... Operations, excepting Johnstown, are unchanged from a week ago.

o o o

... Cambria plant only slightly affected by calling of a strike.

o o o

... Some mills note minor improvement in business over previous week.

PITTSBURGH, June 15.—Steel ingot production in the Pittsburgh district, with the exception of the Johnstown area, averages 93 per cent of capacity, unchanged from a week ago. Estimates of ingot output in the excepted area would be uncertain owing to the strike situation, but recent information discloses that output was off but little the early part of this week. Wheeling operations continue at 100 per cent of capacity.

Incoming business in the past week, if anything, is slightly better than in the previous period. The improvement is noticeable in semi-finished, wire and sheet specifications, as well as a better trend in the ordering of oil-country pipe. Hot rolled and cold finished bar bookings are just about holding their own, while the total volume of heavy plate and shape specifications is off some from a week ago. Aggregate sheet orders are comprised of miscellaneous tonnages for automobile makers, refrigerator and stove manufacturers, in addition to a fair amount of culvert business. Promises on lighter gage cold-rolled sheets have been extended, with one maker quoting shipment in 10 to 11 weeks. Tin plate operations are unchanged at 85 to 88 per cent of capacity.

The marked improvement in the sale of tubular products is confined for the most part to oil-country goods specifications, and it is expected that the flow of this type of orders will continue unabated because of heavy drilling operations.

The raw material market outlook appears uncertain in view of the serious labor disturbances in the

steel industry. Although the "captive" mines of some steel plants have been closed for the past few weeks, the United Mine Workers Union has called a strike of union members at mines operated by two other steel companies involved in steel strikes in an effort to prevent the reopening of closed plants.

No. 1 heavy melting steel is off 50c.

Pig Iron

The past week has disclosed a greater inclination among smelters to place orders for third quarter pig iron requirements. Although prices remain unchanged, the question of supplies has served as an impetus for this movement. Local producers had been turning down foreign inquiry in order to take care of domestic business. Had the hand-to-mouth buying policy exhibited a few weeks ago continued, it would have probably been necessary for pig iron makers to show more attention to export inquiry. Despite the lull in finished steel buying, there is little change in merchant iron consumption. Sanitary ware manufacturers are still busy, but a slight letdown is expected during July and August. Practically no orders have been diverted to this district from the strike regions.

Semi-Finished Steel

Semi-finished specifications in the past week are substantially larger than the average tonnages placed during the previous several weeks. A heavy movement of sheet and tin bars to non-integrated mills continues and a fair amount of skelp orders is in evidence. As

forge shops will soon start production of material for 1938 automobiles, bookings of forging billets are expected to show renewed activity soon.

Bolts, Nuts and Rivets

New business, if anything, was slightly better—the first real improvement in several weeks. Automobile releases are fair and some new buying for clean-ups has taken place, all orders of this type being for immediate shipment. With little impetus to place orders, inasmuch as prices are practically unchanged except for nuts and small rivets, producers look for a quiet market, with purchases being gaged to consumption during the next month or so. Incoming business is roughly estimated at 60 per cent of shipments.

Bars

Hot rolled bar tonnages are about holding their own with aggregate business slightly better than a week ago. With tractor and farm implement manufacturers continuing to operate at record levels, a fair volume of specifications is reaching the mills from these sources. Automobile buying is confined to tonnages necessary to round out old model programs. Automobile companies are expected to place specifications for 1938 models some time in July. Backlogs are easier, with less extended deliveries.

Cold Finished Bars

The total volume of new business is well under the level of a few months ago, but in the past week it has been larger than in the previous period. Shipments are somewhat ahead of fresh orders and deliveries are easier. Automobile purchases, presumably for 1937 models, are numerous, but tonnages involved are small. Agricultural and textile machinery manufacturers have been in the market recently and a fair amount of miscellaneous sizes and grades have been ordered by the jobbing trade. Producers do not look for renewed activity until purchases by automobile companies for 1938 models are made.

Reinforcing Bars

Lettings in the past week have been numerous, but individual tonnages are not very large. A good many jobs are pending, with at least 14,000 tons in the New York City area alone to be awarded soon. Two sewer jobs in New York, totaling approximately 4800 tons are expected to be closed some time in the near future. Mill prices to jobbers are firmer than at any time in

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	June 15, 1937	June 8, 1937	May 18, 1937	June 16, 1936
Rails, heavy, at mill.....	\$42.50	\$42.50	\$42.50	\$36.37 1/2
Light rails, Pittsburgh.....	43.00	43.00	43.00	35.00
Rerolling billets, Pittsburgh..	37.00	37.00	37.00	28.00
Sheet bars, Pittsburgh.....	37.00	37.00	37.00	28.00
Slabs, Pittsburgh.....	37.00	37.00	37.00	28.00
Forging billets, Pittsburgh...	43.00	43.00	43.00	35.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	2.45	2.45	2.45	1.85
Bars, Chicago.....	2.50	2.50	2.50	1.90
Bars, Cleveland.....	2.50	2.50	2.50	1.90
Bars, New York.....	2.78	2.78	2.78	2.20
Plates, Pittsburgh.....	2.25	2.25	2.25	1.80
Plates, Chicago.....	2.30	2.30	2.30	1.85
Plates, New York.....	2.53	2.53	2.53	2.09
Structural shapes, Pittsburgh	2.25	2.25	2.25	1.80
Structural shapes, Chicago..	2.30	2.30	2.30	1.85
Structural shapes, New York	2.5025	2.5025	2.5025	2.06 1/4
Cold-finished bars, Pittsburgh	2.90	2.90	2.90	2.10
Hot-rolled strips, Pittsburgh.	2.40	2.40	2.40	1.85
Cold-rolled strips, Pittsburgh	3.20	3.20	3.20	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	3.15	3.15	3.15	2.40
Hot-rolled annealed sheets, No. 24, Gary.....	3.25	3.25	3.25	2.50
Sheets, galv., No. 24, P'gh...	3.80	3.80	3.80	3.10
Sheets, galv., No. 24, Gary..	3.90	3.90	3.90	3.20
Hot-rolled sheets, No. 10, Pittsburgh.....	2.40	2.40	2.40	1.85
Hot-rolled sheets, No. 10, Gary.....	2.50	2.50	2.50	1.95
Cold-rolled sheets, No. 20, Pittsburgh.....	3.55	3.55	3.55	2.95
Cold-rolled sheets, No. 20, Gary.....	3.65	3.65	3.65	3.05
Wire nails, Pittsburgh.....	2.75	2.75	2.75	2.10
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.15
Plain wire, Pittsburgh.....	2.90	2.90	2.90	2.40
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.45
Barbed wire, galv., Pittsburgh	3.40	3.40	3.40	2.60
Barbed wire, galv., Chicago dist. mill.....	3.45	3.45	3.45	2.65
Tin plate, 100-lb. box, P'gh..	\$5.35	\$5.35	\$5.35	\$5.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	June 15, 1937	June 8, 1937	May 18, 1937	June 16, 1936
No. 2 fdy., Philadelphia.....	\$25.76	\$25.76	\$25.76	\$21.3132
No. 2, Valley furnace.....	24.00	24.00	24.00	19.50
No. 2, Southern Cin'ti.....	23.69	23.69	23.69	20.2007
No. 2, Birmingham.....	20.38	20.38	20.38	15.50
No. 2, foundry, Chicago*.....	24.00	24.00	24.00	19.50
Basic, del'd eastern Pa.....	25.26	25.26	25.26	20.8132
Basic, Valley furnace.....	23.50	23.50	23.50	19.00
Malleable, Chicago*.....	24.00	24.00	24.00	19.50
Malleable, Valley.....	24.00	24.00	24.00	19.50
L. S. charcoal, Chicago.....	30.04	30.04	30.04	25.2528
Ferromanganese, seab'd, car- lots.....	102.50	102.50	102.50	75.00

† This quotation is subject to a deduction of 38c. a ton for phosphorus content of 70 per cent or higher.
* The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh...	\$18.25	\$18.75	\$18.75	\$13.50
Heavy melting steel, Phila...	17.25	17.75	18.25	12.00
Heavy melting steel, Ch'go...	15.75	15.75	16.75	12.75
Carwheels, Chicago.....	18.25	18.25	19.25	13.50
Carwheels, Philadelphia.....	19.75	19.75	21.25	13.75
No. 1 cast, Pittsburgh.....	18.25	19.25	19.25	14.75
No. 1 cast, Philadelphia.....	20.25	20.25	20.75	14.00
No. 1 cast, Ch'go (net ton)...	15.25	15.25	15.25	12.00
No. 1 RR. wrot., Phila.....	19.75	19.75	19.75	14.75
No. 1 RR. wrot., Ch'go (net)	14.50	15.00	15.25	11.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt.....	\$4.60	\$4.60	\$4.60	\$3.65
Foundry coke, prompt.....	5.25	5.25	5.25	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn...	14.00	14.00	14.00	9.50
Lake copper, New York.....	14.125	14.12 1/2	14.12 1/2	9.62 1/2
Tin (Straits), New York....	54.625	56.00	55.25	41.62 1/2
Zinc, East St. Louis.....	6.75	6.75	6.75	4.90
Zinc, New York.....	7.10	7.10	7.10	5.27 1/2
Lead, St. Louis.....	5.85	5.85	5.85	4.45
Lead, New York.....	6.00	6.00	6.00	4.60
Antimony (Asiatic), N. Y....	14.75	14.75	14.50	13.00

The Iron Age Composite Prices

Finished Steel

June 15, 1937	2.605c. a Lb.
One week ago	2.605c.
One month ago	2.605c.
One year ago	2.097c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

	HIGH	LOW
1937.....	2.605c., Mar. 9	2.330c., Mar. 2
1936.....	2.330c., Dec. 28	2.084c., Mar. 10
1935.....	2.130c., Oct. 1	2.124c., Jan. 8
1934.....	2.199c., April 24	2.008c., Jan. 2
1933.....	2.015c., Oct. 3	1.867c., April 18
1932.....	1.977c., Oct. 4	1.926c., Feb. 2
1931.....	2.037c., Jan. 13	1.945c., Dec. 29
1930.....	2.273c., Jan. 7	2.018c., Dec. 9
1929.....	2.317c., April 2	2.273c., Oct. 29
1928.....	2.286c., Dec. 11	2.217c., July 17
1927.....	2.402c., Jan. 4	2.212c., Nov. 1

Pig Iron

\$23.25 a Gross Ton
23.25
23.25
18.84

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

HIGH		LOW	
\$23.25, Mar. 9	9	\$20.25, Feb. 16	16
19.73, Nov. 24	24	18.73, Aug. 11	11
18.84, Nov. 5	5	17.83, May 14	14
17.90, May 1	1	16.90, Jan. 27	27
16.90, Dec. 5	5	13.56, Jan. 3	3
14.81, Jan. 5	5	13.56, Dec. 6	6
15.90, Jan. 6	6	14.79, Dec. 15	15
18.21, Jan. 7	7	15.90, Dec. 16	16
18.71, May 14	14	18.21, Dec. 17	17
18.59, Nov. 27	27	17.04, July 24	24
19.71, Jan. 4	4	17.54, Nov. 1	1

Steel Scrap

\$17.08 a Gross Ton
17.42
17.92
12.75

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

HIGH		LOW	
\$21.92,	Mar. 30	\$17.08,	June 15
17.75,	Dec. 21	12.67,	June 9
13.42,	Dec. 10	10.33,	April 23
13.00,	Mar. 13	9.50,	Sept. 25
12.25,	Aug. 8	6.75,	Jan. 3
8.50,	Jan. 12	6.43,	July 5
11.33,	Jan. 6	8.50,	Dec. 29
15.00,	Feb. 18	11.25,	Dec. 9
17.58,	Jan. 29	14.08,	Dec. 3
16.50,	Dec. 31	13.08,	July 2
15.25,	Jan. 11	13.08,	Nov. 22

the past two years. The movement of small projects requiring less than 100 tons is quite large.

Plates and Shapes

For the second week in succession, both structural inquiries and awards have been small in number and tonnage. Significant among this week's inquiries is the small number of public works projects, as most of the potential business involves private factory and building additions. Mill specifications for both plates and shapes are off some this week, but the decline is not marked. Pittsburgh Bridge & Iron Co. is supplying 650 tons of fabricated material for stock house alterations and additions for Spang, Chalfant & Co., Etna, Pa.

Sheets

Sheet specifications show an increase, and the opinion is growing that the level of business reached a few weeks ago was the low point. A fair amount of cold rolled sheet tonnages were placed recently, with the result that one producer has extended promises on this grade to 10 to 11 weeks. These particular specifications were mostly from automobile makers and represent fill-in requirements for 1937 models. Orders from refrigerator companies are still holding up and it is interesting to note that one large maker has so scheduled production that it usually declines only 10 per cent during the change-over from old to new models. Some specifications from stove makers for prompt shipment have made their appearance and buying by electrical equipment makers continues in good volume. Some motor makers have been making reservations for material for their new models and it is expected that deliveries on some orders will be made some time in August. While diversion of steel business because of the strike situation has taken place, the amount involved so far is small and represents for the most part orders from companies which normally split up the total business between two or more sources.

Tubular Products

The marked improvement in oil-country specifications, which started less than a week ago, continues, with the result that producers have again had to put off the building up of their own stocks. With drilling programs increasing, there is every indication that the steady flow of oil-country goods specifications will make the same good showing as last year, only on a larger scale. National Tube Co. will furnish approximately 5200

tons of 12-in. seamless tubing to the Texas Co., Houston, Tex., for a 40-mi. line pipe. Meanwhile, specifications for miscellaneous short runs of line pipe are in good volume and deliveries are still extended. Standard pipe specifications show little change from recent levels.

Wire Products

The increased activity noticed a few weeks ago on total wire specifications is still apparent, with the bulk of improvement being made up of manufacturers' wire business. Stocks on hand have been depleted and most of the present orders are for sizes and grades urgently required. A fair portion of incoming business can be traced to automobile companies for clean-ups on old models. In some cases reservations for material to go into 1938 models have been arranged. Merchant wire bookings are only fair, but, with the strong possibility of a much better farm purchasing power this fall than last year, producers are hopeful of considerable activity in agricultural areas some time after the next two months. Many farm districts have had an abnormally rainy season with the result that much work has been postponed until a later date. Nonetheless, a fair volume of merchant wire specifications is coming from jobbers whose stock has moved faster than was anticipated.

Strip

Aggregate tonnages booked in the past week are slightly heavier than in the previous period and a goodly portion is coming from automobile manufacturers or parts makers who are winding up 1937 model programs. Buying by steel bed and office furniture manufacturers is rather active and miscellaneous tonnages are going to electrical appliance makers. Incoming business is roughly estimated at between 65 and 70 per cent of shipments, with hot rolled strip backlogs three weeks or less and cold rolled being promised in five to six weeks. Orders diverted to this district because of strike shutdowns are negligible. In view of the approaching change-over period for new car models, producers are looking for a good volume of automobile business, some of which on a small scale, has already materialized.

Tin Plate

Tin plate operations remain at 85 to 88 per cent of capacity and no appreciable change in the situation has occurred except that some tin plate users are beginning to show signs of anxiety over the outcome

of present labor disturbances. So far, however, no inconvenience on account of hold-ups from affected areas has been noticed. Crop reports continue to be reassuring, although it is still too early for definite forecasts to be made.

Coal and Coke

Major attention this week is centered on the calling of strikes by the United Mine Workers at the "captive" mines of Republic Steel Corp., Youngstown Sheet & Tube and Bethlehem Steel Co. This action was taken by John L. Lewis in an attempt to cut off coal supplies of those steel companies which are resisting efforts of the SWOC, a CIO affiliate which Mr. Lewis heads, to obtain signed contracts. The coal mines of Republic and Sheet & Tube had been shut down on orders of the companies before the strikes were called. Lewis is trying to make the strikes work the double purpose of not only helping the SWOC to get a contract but to attempt to force the steel companies in question to sign a contract with the United Mine Workers. Since the cessation of the coal strike in April these companies have been working under a verbal agreement with the United Mine Workers. The dictatorial nature of the United Mine union is exemplified in the statement that no commercial coal producer working under a union contract may ship coal to any of the steel plants affected by strikes at the so-called "captive" mines. Meanwhile, the beehive coke situation in the Connellsville regions has become entangled more deeply in the maze of labor disturbances involving coal, steel and possibly iron ore.

Bids on Destroyers To Be Taken Aug. 4

WASHINGTON, June 15. — Proposals for the construction of four of the eight destroyers of the 1937 building program will be opened in the Navy Department Aug. 4. Terms of the Vinson-Trammell Act, March 27, 1934, which authorized the replacement of naval vessels, require that four of the eight destroyers be allocated for construction in Navy yards.

The 1937 program for replacement of naval vessels provided for the construction of eight destroyers and four submarines. Bids for the construction of two of those submarines will be opened in the Navy Department on June 17. Bids for the construction of one battleship will also be opened at that time.



CHICAGO

... **Ingot output up one point to 64 per cent of capacity.**

... **New business not gaining, but contract specifications are heavier.**

... **Chicago subway to cost \$50,000,000 and Lake highway, \$75,000,000, proposed.**

CHICAGO, June 15.—Ingot output advanced one point this week to 64 per cent of capacity as a result of slight increases in operations at Carnegie-Illinois Steel Corp. and Republic Steel Corp.

Business throughout this district has been adversely affected by the steel strikes, and, although operations in those mills not on strike are increasing somewhat, this situation is caused more by specifications against old orders than new buying. Steel companies untouched by strikes are still not receiving an appreciable amount of new business from customers of the struck plants. One seller reports last week's sales about equal to the average week so far this year, while another states that new orders are definitely less. Specifications are heavy against old plate orders for car building, but new buying is negligible. Deliveries of some grades of sheets are slightly improved, although general demand is holding up well. Structural demand is only fair, and many fabricators are unoccupied, while sellers of reinforcing bars report a decided lack of important tonnages.

Foundries generally and manufacturers of farm equipment are operating at unchanged high rates. Car builders are currently occupied with old orders and some new business, and will probably be able to continue about as at present throughout the summer, but no new programs of any size have been announced. Most builders look for a secondary buying movement in cars late in the summer, depending on the labor situation and crop prospects. If the anticipated car shortage develops, many are wondering if the railroads will be able to obtain the necessary funds to purchase new equipment.

Proposals were announced last

week for two huge construction projects in Chicago and vicinity. One of these will involve \$50,000,000 and is for a long-discussed subway. Mayor Kelly has been authorized to apply to the Federal Government for a grant or loan. Plans have not yet been drawn and so far officials are merely trying to arrange a financial reorganization of the Chicago traction lines. A proposal was placed before the city officials for twin highways across Lake Michigan from Jackson Park to Gary, Ind., which would cost about \$75,000,000. The proposed plan would include twin dikes with a highway topping each, three locks, and three single leaf bridges at either end of each lock. This plan is intended to end the water pollution from the Calumet River and the Indiana industrial plants and to provide a flood basin and anchorage.

Trading in scrap is still practically at a standstill pending the settlement of the strikes, and prices are nominal.

Pig Iron

Shipments are running a little less than 10 per cent ahead of the first 13 days in May, while a fair tonnage of iron is being sold from day to day. Consumers with stocks sufficient to last 60 days or more are for the most part reducing their inventories, but those users who have only 30 days' supplies on hand are maintaining their stocks and buying new iron.

Shipments are about 15 per cent greater than for the first 13 days of May, and activity shows no signs of lessening. Total sales for this month are expected to surpass those of May, and about equal those of April.

Plates

Deliveries are unimproved, al-

though new business is being received in only fair volume. Leading producers are still quoting from 12 to 14 weeks. Although car builders are not buying in any quantity at present, their specifications against old orders are heavy. New car buying by railroads is at a minimum. Seaboard Air Line recently placed 200 box cars with Pullman Standard Car Mfg. Co. Owens-Illinois Glass Co. ordered 50 hopper cars from General American Transportation Corp.

Wire and Wire Products

Inquiries for wire products are practically unchanged from last week. The automobile industry is still lagging in its specifying.

Structural Shapes

Structural work in this immediate district remains quiet, although throughout the Middle West there seems to be a slight increase in activity. In Purcell, Okla., 2350 tons for a bridge was divided between J. B. Klein Iron & Foundry Co. and Capital Iron Works. A bridge at Shiprock, N. M., requiring 1000 tons went to Pittsburgh-Des Moines Steel Co. Inquiries total over 8000 tons.

Rails

No new rail purchases have been reported, but some sellers believe that a secondary rail buying movement may be seen later in the summer, when crop information becomes more definite. Deliveries of rails from one large rail mill are expected to ease considerably in the next few weeks, as backlogs are fast being reduced.

Reinforcing Bars

No awards of over 100 tons have been reported this week, and inquiries are said to be the lightest for some time. A Post Office garage in Chicago, which is expected to take around 500 tons of bars, will be out for bids the end of the month. One seller states that the dearth of construction jobs is caused by high costs, and that, since the Government has held up much of its public works funds, little of this type work is under way.

Warehouse Business

Demand for warehouse material continues good, and sellers report little crowding in from consumers who ordinarily purchase from some of the closed mills in this district. Similarly the regular warehouse trade is not rushing to place orders as might be expected in view of the fact that no end of the strikes is in sight. Business is steady, however, and June sales thus far are about equal to those of May.

MONTHLY SHIPMENTS OF FINISHED STEEL PRODUCTS BY UNITED STATES STEEL CORP.—TONS								
Month	1933		1934		1935		1936	
	Ship- ments	Per Cent of Ca- pacity	Ship- ments	Per Cent of Ca- pacity	Ship- ments	Per Cent of Ca- pacity	Ship- ments	Per Cent of Ca- pacity
January	285,137	17.7	331,777	19.8	534,055	31.9	721,414	44.8
February	275,929	18.5	385,500	25.9	583,137	39.2	676,315	45.3
March	256,793	15.3	588,209	35.2	668,056	41.5	783,552	50.5
April	335,321	21.6	643,009	41.5	591,728	36.7	979,907	63.2
May	455,302	27.1	745,053	44.5	598,915	35.8	984,097	63.4
June	603,937	37.4	985,337	61.2	578,108	36.7	886,065	57.1
July	701,322	45.1	369,938	23.9	547,794	34.0	950,851	61.3
August	668,155	39.8	378,023	22.6	624,497	37.3	923,703	59.6
September	575,161	35.6	370,306	23.9	614,933	39.7	961,803	62.0
October	572,897	35.5	343,962	20.6	686,741	41.1	1,007,417	62.6
November	430,358	26.7	366,119	22.7	681,820	42.3	882,643	59.2
December	600,639	38.7	418,630	27.0	661,515	42.7	1,067,365	68.8
Plus or minus yearly adjustment	(+44,283)	...	(-19,907)	...	(-23,750)	...	(-40,859)	...
Total for year	5,805,235	30.1	5,905,966	30.6	7,347,549	38.1	†10,784,273	58.2

* Revised to capacity at Jan. 1, 1937. † Adjusted.

U. S. Steel Corp. Shipments in May

MAY shipments of finished steel products by subsidiary companies of U. S. Steel Corp. amounted to 1,304,039 tons, compared with 1,343,644 tons in April and 984,097 tons in May, 1936. May figures represent the highest tonnage shipped in any May since 1929, when shipments were 1,539,738 tons.

Shipments for the first five months of this year were 2,200,439 tons above those in a comparable period in 1936, an increase of 53 per cent.

PERSONALS

Myron C. Taylor, who returned from Europe last week to attend the funeral of George F. Baker, will return to Europe the latter part of this week.

WILLIAM G. HULBERT, who has been general works manager of the Taylor-Wharton Iron & Steel Co. High Bridge, N. J., since May 1, has been elected vice-president, succeeding the late S. M. Buck. Mr. Hulbert will continue in charge of manufacturing at both the High Bridge, N. J., and Easton, Pa., plants of the company.

F. W. DANIELS has been appointed chief engineer, H. K. Ferguson Co., Cleveland engineer and contractor. He has been connected with the Ferguson organization since 1924 as structural designer.

B. G. PARKER, Youngstown Foundry & Machine Co., Youngstown, was installed as new chairman of

the northeastern Ohio chapter of the American Foundrymen's Association at the recent year-end meeting. L. P. ROBINSON, Werner G. Smith Co., Cleveland, is the new vice-chairman; J. H. TRESSLER, Hickman, Williams & Co., Inc., Cleveland, secretary, and R. F. LINCOLN, Osborn Mfg. Co., Cleveland, treasurer. New directors are: DAN MCAVOY, Grabler Mfg. Co.; F. R. FLEIG, Smith Foundry Supply Co., Cleveland; FRANK J. DOST, Sterling Foundry Co., Wellington, Ohio, and FRANK G. STEINBACH, Penton Publishing Co., Cleveland.

R. CLEMENTS REICHEL, formerly general sales manager for the Jordan Motor Car Co., Cleveland, has been appointed general sales manager of the General Body Corp., Detroit, maker of welded steel passenger trailers. For the past five years, Mr. Reichel has been engaged in an intensive study of the potentialities of the trailer market.

H. J. KIENER, of Hickman, Williams & Co., St. Louis, has been elected president of the St. Louis chapter of the Institute of Scrap Iron and Steel.

Tutein Opens Philadelphia Office

E. ARTHUR TUTEIN, INC., Eastern pig iron sales agent for Sloss-Sheffield Steel & Iron Co., Birmingham, has opened a Philadelphia office at 1608 Walnut Street, in charge of Charles E. Trommer, a pig iron man of long experience.

Unemployment at Lowest in April

UNEMPLOYMENT in the United States declined in April by more than half a million persons to a total of 6,981,000 according to the latest report of the National Industrial Conference Board.

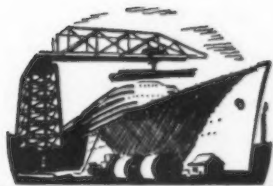
This number constituting the lowest total for any month since the summer of 1931 when conditions were steadily becoming worse, marks a decrease since January of this year of 1,400,000 persons.

The April unemployment total compares with 7,513,000 in March and 8,116,000 in February of this year and with 9,325,000 in April, 1936, according to the Conference Board.

The decline in unemployment between March and April of 532,000 workers was due largely to the increase in employment of 270,000 workers in agriculture, 110,000 workers in manufacturing, and lesser amounts in other fields of enterprise.

Total employment in April aggregated 45,913,000 workers, of whom 34,877,000 were engaged in non-agricultural and 11,036,000 in agricultural pursuits. The April total of 11,802,000 workers employed in manufacturing reflected a gain of almost 5,000,000 persons compared with the July, 1932, low for this field of enterprise. This total according to the Conference Board was almost a half a million greater than during September, 1929, the highest month of employment in that year, when 11,371,000 workers were engaged in manufacturing activities of all kinds.

Between March, 1933, the month of low ebb of employment in all fields of activity, and April of this year there has been an increase in employment of 10,327,000 workers.



.. PHILADELPHIA ..

... District rate unaltered at 69 per cent.

□ □ □

... Producers on edge due to strike threats.

□ □ □

... Buying still lags, but backlogs remain heavy.

PHILADELPHIA, June 15.—The strike at Bethlehem's Johnstown plant has district producers a little worried. Although no plant in this area is threatened so far, no one knows when the situation may be altered. The reduced coal deliveries to Bethlehem plants at Bethlehem, Sparrows Point and Steelton have so far interfered not at all with operations, inasmuch as several weeks' supply of coal is on hand.

Pencoyd has taken off one open hearth for repairs, but the addition of a fifth Alan Wood furnace compensates for this loss, and the district's aggregate operating rate remains at 69 per cent of capacity. There are still enough orders on books to keep local mills busy at current rates over the next month, and enough additional business is trickling in to guarantee comparatively satisfactory operations throughout the summer.

Pig Iron

Foundry orders have fallen off to some extent, and most melters have their iron requirements for the next several months well covered by contracts. For this reason sellers are encountering little buying interest. Export shipments are going out regularly from this port, but district furnaces still have from 100,000 to 150,000 tons yet to deliver abroad. Reports in other areas of a 75,000-ton French inquiry for foundry iron have not been verified in this territory.

Sheets and Strip

Jobbers report a falling off in miscellaneous buying, which they trace back for the past three or four weeks. Larger buyers here continue to eat into their stocks and ask for deliveries on contracts, but are generally disinterested in entering replacement orders. Nonetheless, mill backlogs are as ex-

tended as they ever have been, and delivery promises for cold rolled sheets have actually been pushed forward from one to two weeks by several mills. This variation from the general trend either indicates that some large consumers have switched business from struck mills or are entering heavy orders to take care of new automobile models, on which full production is expected by the middle of August. The Pressed Steel Co. of Great Britain has placed a few small sheet orders here. The Budd company last week ordered 150 tons of stainless strip for the new Reading train, and has recently ordered large quantities of automobile sheets for delivery in July and later. The Lewisburg prison took bids yesterday on 110 tons of

hot rolled pickled sheets, but disposition of the tonnage is yet unannounced.

Shapes and Bars

Two local fabricators were awarded a total of 310 tons of shapes during the week, but otherwise little has been added to mill books. New business continues to develop very slowly. About 750 tons of shapes and 1600 tons of bars are involved in a new Philadelphia high school at Ogontz and Olney Avenues, on which bids are due June 22. Tenders on a 560-ton bridge in Westmoreland County, Pa., go in late this week, and a number of smaller bridges in Pennsylvania and New Jersey, aggregating about 650 tons, are up for figuring over the next fortnight. Reinforcing steel estimators are far from busy, and prices in several instances have shown signs of wobbling. A bridge at Lehigh, Pa., requiring 440 tons, has been awarded to Bethlehem Steel Co., and Sweet's Steel Co. will supply the 1600 tons of bars for the new Philadelphia school at 67th Street and Elmwood Avenue.

Imports

The following iron and steel imports were received here during the past week: 5288 tons of chrome ore from French Oceania; 192 tons of sponge iron, 40 tons of charcoal bar iron, 50 tons of steel forgings, 106 tons of steel billets, 52 tons of steel tubes, 61 tons of wire rods and 87 tons of steel bars from Sweden.



.... BUFFALO

... Hanna furnace goes in-to blast.

□ □ □

... Pig iron buying of fair proportions.

BUFFALO, June 14.—Blast furnace operation has been increased by the lighting of a third stack at the plant of the Hanna Furnace Corp.

The second week of the third quarter buying finds pig iron buying slowing up somewhat, as melters complete coverage. New business was about what producers had expected, but less than first and second quarter as many

melters are using up their inventories of cheaper iron. The greater portion of iron placed was in small lots, though several large tonnages were ordered.

Bryant & Detwiler, Detroit, are the general contractors for the new Buffalo plant of the Chevrolet Motor Car Co., but there has been no announcement of the separate awards. C. B. Moon & Co., Cleveland are low bidders for the Ontario Street crossing of the New York Central. Bids will be taken June 22 for the new University of Buffalo gymnasium, involving 350 tons of structural steel. The National Aniline & Chemical Co. has awarded contract for a 300-ton structural steel building to a Buffalo fabricator.

Open-hearth operations are the same as last week. Conditions at the plant of the Republic Steel Corp. where an estimated 100 men are on strike, are unchanged. The plant is working at almost capacity, and the results of the picketing are negligible.



... Pig iron sales small for third quarter.

BOSTON, June 15.—The first 15 days of June resulted in not much more than 10,000 tons of pig iron sold for third quarter delivery. The uncertainty of the labor situation all over the country, the scarcity of molders, and a generally adopted policy by foundries to buy only as actually needed accounts for the backwardness of buying so far. Most foundries are busy on a five-day or less weekly schedule, with prospects of maintaining current operating schedules during the remainder of 1937.

Calling for bids by Massachusetts on about a dozen small bridges gives the fabricated steel market a more active appearance. Big tonnages are lacking, the 300 tons involved in the Westinghouse Electric & Mfg. Co., East Springfield, foundry being the largest under consideration. Current buying of reinforcing steel likewise is in small lots, although several 100 to 300 ton lots still remain to be closed. Cast iron pipe manufacturing is holding up well despite a slump in new bookings.



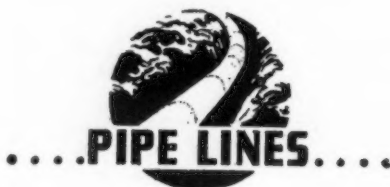
... Reinforcing bar market is more active.

SAN FRANCISCO, June 14.—The reinforcing bar market was more active on the Pacific Coast last week than at any time during the past two months. Bar awards aggregated 2870 tons, of which nearly 2000 tons was involved in reclamation projects. Bethlehem Steel Co. took 920 tons for the All-American Canal project and Colorado Fuel & Iron Co. took 440 tons called for by the Shoshone project at Cody, Wyo. At Red Bluff, Cal., 200 tons of bars to be used in a bridge across the Sacramento River was awarded to Truscon Steel Co.

In contrast, the market in all

other forms of iron and steel was inactive. Outstanding was the award of the Mad River pipe line at Eureka, Cal., to United Concrete Pipe Corp., Los Angeles. Some 60,000 lin. ft. of 24 and 30-in. pipe is involved.

Bids will be opened at Los Angeles June 29 on 1076 tons of deformed reinforcing bars for use in construction of Nichols Canyon Debris Basin. Also on June 29 in Los Angeles bids will be opened on 908 tons of bars for a trash rack for San Gabriel Dam. Bids have been opened on 667 tons of reinforcing bars for the Salt River reclamation project at Phoenix, Ariz.



Northern Indiana Public Service Co., Hammond, Ind., and **Michigan Gas Transmission Corp.**, United Artists' Building, Detroit, plan joint construction of welded steel pipe line to Fort Wayne, Ind., for natural gas transmission. Connection will be made with main trunk line of last noted company at point south of Fort Wayne. Distribution in municipality will be carried out by Northern Indiana company, which now operates artificial gas properties in that area, and will include control station and distributing lines and facilities. Line to be tapped connects with main transmission line of Panhandle Eastern Pipe Line Co., Kansas City, Mo., furnishing natural gas in northern Indiana and Michigan from gas properties at Amarillo, Tex.

Standish Pipe Line Co., Bartlesville, Okla., plans 4 and 6-in. welded steel pipe lines from oil properties near Ellis, Kan., about 95 miles, for crude oil transmission. Cost over \$500,000 with booster pumping stations and operating facilities.

Hayes Brummitt Co., Rockwood, Tenn., plans welded steel pipe line from gas field at Sunbright, Tenn., to Rockwood, for natural gas transmission for municipal distribution. Control station and distributing lines will be installed. Thomas H. Phillips, mayor, Rockwood, is active in project.

Quartermaster, Fort Benjamin Harrison, Ind., asks bids until June 22 for galvanized welded steel pipe and black welded steel pipe (Proposal 384-57).

Ville Platte, La., has let contract to Dixie Mill Supply Co., for welded steel pipe for pipe line from Eunice, La., to Ville Platte for natural gas transmission for municipal distribution; also an award to Lewis & Reich, Ville Platte, for installation. Cost about \$75,000. F. P. Joseph, Glenmora, La., is consulting engineer.

General Purchasing Officer, Panama Canal, Washington, closes bids June 25 for welded steel pipe; also for 16,000 ft. of galvanized welded steel pipe (Schedule 3263).

Tulsa Pipe Line Co., Tulsa, Okla., has plans for 12-mile 8-in. oil line from We-woka, Okla., south to Canadian River; 14-mile 8-in. pipe line from Fittstown to Centrahoma, Okla., and 16-mile 6-in. line from Francis to Spaulding, Okla. First two lines will be built by own organization using Lindeweld method for welding all joints.



... Producers still have large backlogs.

o o o

... Outlook good for third quarter operations.

BIRMINGHAM, June 15.—Iron and steel producers will enter the third quarter in good shape, with heavy backlogs still on their books. Steel buying has continued active all through the present quarter, some weeks exceeding shipments, some weeks dropping slightly behind. The result is that steel backlogs, other than rails, are still large. Ordinarily, this is the dull season for wire products and roofing sheets, when warehouse stocks are built up for the fall revival. But thus far the mills have not been able to stock much. It now looks as if the Ensley rail mill will run into August. Bar demand has been more active of late and considerable tonnage is now pending.

Little interest has been shown by foundries in third quarter pig iron, but tonnage is gradually accumulating. Iron backlogs are still large and it is likely that shipments will have to be extended into the next quarter. Furnaces have sufficient business on hand to provide a comfortable outlook for some time to come. June shipments are expected to exceed those of May.

Republic Steel blew in its Thomas furnace last week. This had been out for repairs. The district total is 17, as previously reported. Last week 19 open hearths operated for a part of the week and 18 for the remainder. This week 18 are scheduled.

Republic Steel is planning to go ahead with improvements at its Gadsden plant. Two new open hearths will be built and another enlarged. There is also talk of an addition to the company's by-product coke plant at Thomas.

Labor troubles have not yet beset Republic in this district. Some attempts at organization have not interfered with operations. Last week the Tennessee Coal, Iron & Railroad Co. signed a collective bargaining agreement with the Brotherhood of Mine Workers in captive mines. This covers members of the organization in coal mines.



... CLEVELAND ...

... New business in steel rather light, but some mills note improvement.

□ ○ □

... Operations in strike-affected plants are substantially unchanged.

○ ○ □

... Total Lake ore movement unaffected as boats are switched to other companies.

CLEVELAND, June 15.—With little change in operations of strike-bound plants in northern Ohio, the ingot output in the Cleveland-Lorain district is unchanged this week at 56 per cent of capacity. Output in the Youngstown district dropped one point to 44 per cent of capacity. Finishing mill operations are about the same as a week ago. Youngstown mills remain closed, but Republic mills at other points in the Youngstown district and Canton continue in partial operation.

New business in finished steel continues rather light, although some mills report a slight improvement. Most consumers apparently have ample stocks or orders outstanding for enough steel for their requirements for some time.

Labor troubles in the steel and other industries are a disturbing factor that is causing some hesitancy among buyers in placing new orders. There is some increase in orders for sheets, bars and strip from consumers who because of the strike have had to seek new sources of supply, but these orders are not numerous. As pressure for deliveries has virtually disappeared, some of the mills are able to take additional tonnage for shipment when needed without inconveniencing customers who already have orders on the mill books. Because consumers are able to buy steel elsewhere, there is little, if any, complaint about difficulty in securing shipments because of the strike interruptions.

The sheet mills of the W. H. Davey Steel Co., Cleveland, were shut down this week because of exhaustion of its stock of sheet bars supplied by the Cleveland works of the Republic Steel Corp. The Davey company decided to shut

down for an indefinite period rather than to buy sheet bars elsewhere.

Deliveries generally continue to improve, but very slowly.

Movement of Lake Superior ore has not been affected by the steel strike, as boats hauling ore for the strike-bound independent steel companies have been shifted to move ore for other steel plants, which, in view of the absence of any excess in Lake vessel capacity this year, are glad to take in ore more rapidly than their regular shipping schedules call for. By reversing this flexible shifting of ore cargoes, the loss of shipments to the strike-ridden steel companies may be made up later in the season.

One of the effects of the strike is the cutting off of pig iron shipments from Cleveland to Saginaw and return cargoes of scrap.

Pig Iron

Foundries have no incentive to buy iron for the third quarter and not much business is being booked for that delivery, and orders are not being solicited by producers. Some furnaces are shipping more iron this month than in May. Most foundries, except those affected by strikes, are expected to take deliveries this month of practically all the iron they have under second quarter contract. Shipments by several Central Western furnaces have been suspended because of the steel strike, but consumers are able to secure the iron they need from other sources.

Iron Ore

Stocks of ore on Lake Erie docks were reduced 1,429,434 tons during May in spite of the very heavy shipments during that month. Dock stocks June 1 were only 2,544,190 tons. Ore receipts at Lake Erie

ports during May amounted to 6,694,658 tons and for the season 8,524,419 tons as against 2,650,851 tons for the same period last year. From these docks there was shipped 4,805,300 tons during May and 6,875,129 tons until June 1 as compared with 2,827,790 tons during the corresponding period last year.

Sheets

While some business continues to come from the motor car manufacturers for new models, the volume of new business is only moderate. A few consumers who are unable to secure shipments from the regular sources of supply because of strikes, are diverting orders to other mills. No consumers seem to be suffering from inability to secure sheets as needed. Some buyers are placing orders for fourth quarter shipment in order to get a place on the mill rolling schedules.

Strip Steel

New demand is light for both hot and cold rolled strip. Little business is coming from the automobile plants and stamping plants making motor car parts, as these are slowing down operations preliminary to the bringing out of new models. Many consuming plants still have fair stocks. Mills have enough backlog to keep them busy six weeks.

Bars, Plates and Shapes

While merchant bars are still in light demand, forging companies are now figuring on orders for forgings for new models of automobiles and a pick-up in orders from the forging industry is expected in the next two weeks. Many miscellaneous consumers still have good stocks. Structural shapes are in fair demand, although new construction projects are scarce. State work is held back by a delay by the Legislature in making appropriations. Taking of bids for 3500 tons of structural shapes for the Industrial Rayon Corp. plant in Painesville has been deferred until June 22. This plant will take 1500 to 1800 tons of reinforcing bars instead of 300 tons as previously announced. Plates remain fairly active. Deliveries show little change, ranging from four to six weeks on bars and six to eight weeks on plates and shapes.

A large, modern can producing plant has been completed by the Continental Can Co., in Tampa, Fla. The structure, designed and built by the Austin Co., Cleveland provides a total of 60,000 sq. ft. for manufacturing and warehousing activities on one floor, with a 3200 sq. ft. office area on second.



**... Awards of 5150 tons
—12,450 tons in new
projects.**

AWARDS

Greenwich, Conn., 440 tons, Merritt Parkway, to Bethlehem Steel Corp.

New York, 280 tons, New York Central Railroad viaduct, Dyckman Street, to Bethlehem Steel Corp.

New York, 220 tons, bulkhead for Consolidated Edison Co., to Bethlehem Steel Corp.

Nassau County, N. Y., 200 tons, State bridge, to Carroll-McCreary Co.

Dutchess County, N. Y., 625 tons, highway work, to Wickwire-Spencer Steel Co.

Philadelphia, 1600 tons, school at 67th Street and Elmwood Avenue, to Sweet Steel Co., erroneously reported to Bethlehem Steel Corp. last week.

Lehigh, Pa., 440 tons, bridge, to Bethlehem Steel Corp.

Chicago, 250 tons, ABC building, to O. J. Dean & Co.

Panama Canal Zone, 475 tons, by lot, to Virginia Steel Co.

Red Bluff, Cal., 207 tons, bridge over Sacramento River, to Truscon Steel Co.

Stockton, Cal., 162 tons, underpass to San Jose Steel Co.

Oakland, Cal., 110 tons, Franciscan residence, to Concrete Engineering Co.

Holtville, Cal., 157 tons, All-American Canal project, to Bethlehem Steel Corp.

Potholes, Cal., 610 tons, All-American Canal project, to Bethlehem Steel Corp.

Potholes, Cal., 109 tons, All-American Canal project, to Judson-Pacific Co.

Potholes, Cal., 283 tons, Gila project, to Judson-Pacific Co.

Cody, Wyo., 441 tons, Shoshone project, to Colorado Fuel & Iron Co.

Fresno, Mont., 123 tons, Chain Lakes project, to Inland Steel Co.

NEW REINFORCING BAR PROJECTS

Queens, N. Y., 2810 tons, sewer; Charles F. Vachris, Inc., Brooklyn, low bidder.

Queens, N. Y., 1750 tons, Tallman Island sewer treatment works; North Eastern Construction Co. low bidder.

Brooklyn, 2000 tons, Williams Avenue sewer; Luang Construction Corp. low bidder.

Attica, N. Y., 380 tons, cell block for State prison; rebid.

Philadelphia, 1600 tons, high school at Ogontz and Olney Avenues; bids June 22.

Painesville, Ohio, 1500 to 1800 tons, plant for Industrial Rayon Corp.; previously reported as 300 tons; bids June 22.

Phoenix, Ariz., 670 tons, Reclamation Bureau project 42717-A.

Milwaukee, 620 tons, Milwaukee-Western Malting Co. building; bids soon.

Phoenix, Ariz., 865 tons, Salt River project; bids opened.

Phoenix, 123 tons, highway work; bids June 29.

Los Angeles, 1076 tons, Nichols Canyon Debris Basin; bids June 29.

Los Angeles, 908 tons, trash rack for San Gabriel Dam; bids June 29.

Los Angeles, 123 tons, highway construction; bids July 1.

Bonneville, Ore., 271 tons, fender blocks and wall extension; Gilpin Construction Co. low bidder on general contract.



**... Sheet bookings assure
good summer operations.**

CINCINNATI, June 15.—With a large percentage of sheet users covered through third quarter, bookings of district mills are sliding off. New business the past week averaged about 75 per cent of mill capacities. A small portion of this was for rush shipment to new buyers in this district, whose normal sources are restricted by labor trouble. The amount of this business, however, is not proportionately large since consumers apparently had built up sizable inventories. Steady capacity production schedules are reducing mill backlogs, and delivery dates are getting closer to consumer desires. Advance orders, however, are still sufficient to warrant full operations well into the summer months. Automotive specifications are heavier than usual for this time of the year.

Steel ingot production eased a few points to about 91 per cent when one interest took off an open hearth furnace. Thirty-one open hearths out of 34 are now in operation.

Pig iron users are apparently well supplied or covered for immediate and early future needs. Bookings, except for scattered carload lots, are almost nil. Shipments are brisk as furnace interests notify users to complete present contracts by July 10. Foundry operations are easing as melters catch up with backlogs. New foundry business is negligible and some interests are spreading work to keep available labor employed.

Seasonal influences caused a slight decline in warehouse business the past week. Activity, however, is still above anticipations for early summer, since jobbers are profiting from mill delivery delays.

Carnegie-Illinois Lets Mill Contracts

CARNEGIE-Illinois Steel Corp. has let contracts for the principal mill and equipment installations at the company's Irvin works and for a slabbing mill at the Edgar Thomson plant.

Contracting companies were the Mesta Machine Co., United Engineering & Foundry Co., both of Pittsburgh, the Continental Roll & Steel Foundry Co. of Chicago, and the E. W. Bliss Co., Toledo, Ohio.

The contracts call for installation of an 80-in. continuous hot strip mill, three cold reduction mills and nine temper pass mills at Irvin works and one 48-in. slabbing mill at Edgar Thompson works, Braddock, Pa.

A contract for excavation and sewerage and installation of foundations and concrete work for the slabbing mill was let to the Rust Engineering Co. of Pittsburgh. The mill, which will have a capacity of 1,000,000 tons annually, will supply semi-finished steel for Irvin works, excavation for which is in progress at Camden Hill in Mifflin Township, and other plants of the company.

Machine Tool Orders Lower in May

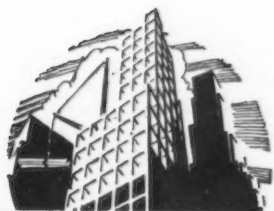
ORDERS for machine tools in May dropped back to about the level of March, according to the monthly index report of the National Machine Tool Builders' Association. The index figure for May was 208.5 compared with 282.5 in April and 211.6 in March. However, the three months' moving average, at 234.2, is at a peak.

The index for May brings the average for five months this year to 214 compared with 178 for the 12-month period ended in May.

Domestic orders decreased in larger percentage from April than foreign orders, the latter being down but 5 per cent to 22 per cent of the total.

Track Shipments Lower in May

SHIPMENTS of trackwork for T-rail track of 60 lb. per yard and heavier amounted to 8807 tons in May, compared with 9888 tons in April, and 7314 tons in May, 1936. Shipments for the first five months of this year were 44,814 tons, an increase of 16,729 tons over the total of the similar period in 1936.



... NEW YORK ...

... Spread of strikes to Bethlehem Steel Corp. has caused no scare buying.

o o o

... Market is quiet, with decline in new business continuing.

o o o

... Loss of tin plate output is most serious phase of production curtailment.

NEW YORK, June 15.—Although strikes have been extended to the Johnstown, Pa., plant of the Bethlehem Steel Corp., no buying scare has developed among steel buyers. Some buyers who are in need of steel for specific purposes, such as pipe for construction jobs, have been obliged to divert their orders to mills that are able to ship promptly, but the aggregate of business that has been definitely lost to the strike-affected companies appears to be small thus far.

So far as consumers are concerned, the loss of steel production in the three weeks of the strike has not been serious except in tin plate. It has for some time been apparent that the requirements of canners for this year's vegetable and fruit crops would be large, but now that weather indications seem to assure bountiful harvests in most farm products there may be a shortage of cans for late crops if the strikes are not soon settled. The loss in tin plate output is about 30,000 tons a month, or approximately 17 per cent of the average monthly production in 1936, when the year's total was 2,103,153 gross tons. Plenty of cans are available for early crops, but if the strike continues for many more weeks the loss of production may bring a tin plate shortage later in the year.

Companies not affected by strikes have experienced no improvement in business because of the inability of buyers to obtain supplies from their regular sources. On the contrary, the total volume of new business continues to show the slowing-up tendencies of the previous two or three weeks. As the strikes

lengthen, it is to be expected that there will be new demands upon unaffected steel producers, but there are only minor indications at the moment of this trend.

Wire

Common wire is now quotable at 10 to 14 days delivery, but the volume of incoming orders is on a par with shipments, so that operations are being maintained at a fair rate. Practically no new business is reported as a result of switches due to strike shutdowns.

Pig Iron

Domestic buying is light, but several sales agents report orders from unsolicited sources, interpreted as a move on the part of foundries to protect operations in the event of prolonged labor difficulties. Another indication of this same type of buyer thinking is revealed in demands for more prompt shipment of iron by consumers who a few weeks ago were asking the furnaces to hold back on contract iron. Some fear is expressed that furnace operations in the Buffalo district may be affected by a possible coke shortage, should John Lewis' threat to independent coal companies serving struck steel mills be carried out. Barge shipments of iron to this area have been very heavy since the season opened, and a third stack for merchant pig was recently blown in, largely to catch up with the demand in the eastern market.

Export inquiry is light. Requests for small tonnages of iron have come in from Chinese sources, but no new business is reported from

Japan. The rumor that the French are in the market for 75,000 tons is officially denied by the French Consulate and cannot be checked from private sources. In fact, a recent letter from the United States Commercial Attaché at Paris to a New York agent indicates that no French consumers are interested in American iron.

Plates and Sheets

Awarding of the plate contract for two 1700-ton oil tankers by the Sinclair Navigation Co. on Wednesday is the only new business of consequence in sight after a very dull week. Orders have fallen sharply. As a result, backlogs are being reduced and delivery promises have been improved to eight or 10 weeks or better. Floor plates are moving in good volume, and deliveries are prompt. Sheet business has fallen off, but immediate delivery is being asked on some material originally scheduled for delivery as late as October. This would indicate that consumption is at a faster pace than anticipated.

It is said that the Pennsylvania and New York Central are designing duplicate modern trains for the New York-Chicago run. Each road will probably have built eight trains of 12 cars each. The Pullman Car Mfg. Co. will make most of these cars. The locomotives are already on order.



RAILROAD BUYING

New York, New Haven & Hartford has ordered six streamlined electric passenger locomotives, more powerful than any of the 53 now in operation between New York and New Haven, from General Electric Co.

Philadelphia Department of Transit, Philadelphia, has placed an order for 50 subway cars with Pressed Steel Car Co.

Newfoundland Railroad is inquiring for one 2-8-2 type locomotive.

Canton Road has ordered one diesel-electric locomotive from Electro-Motive Corp.

RAILS AND TRACK SUPPLIES

Los Angeles Union Station is inquiring for 1100 tons of rails.

St. Louis-Southwestern has been authorized to purchase approximately 23 miles of 112-lb. rails.

Missouri-Kansas-Texas is contemplating purchase of an undetermined tonnage of 112-lb. rails.

J. G. Brill Co. has received an order from St. Joseph Railway, Light, Heat & Power Co., St. Joseph, Mo., for eight 30-passenger and eight 40-passenger trolley coaches.



... Steady volume of buying assures good operations.

TORONTO, June 15.—There is a steady flow of spot buying of steel. New business, together with backlogs, will sustain present high operating schedules to the end of the year. The agricultural implement industry is enjoying a demand for implements at the highest level in a number of years, and companies associated with this industry have increased operations and also are taking larger quantities of raw materials. The Canadian automotive industry also is a persistent buyer of materials. From the mining industry orders for plant, tools and equipment are appearing in fair volume, but sales are running below those of a year ago due to difficulty of financing operations at this time. Railroad equipment manufacturers are maintaining almost capacity schedules on orders received earlier in the year. Officials of steel companies do not look for further price changes in the immediate future.

Melters continue to show interest in pig iron and there is a steady demand for both foundry and malleable grades. Local blast furnace representatives state that they look for third quarter booking to correspond with that for second quarter. Iron prices are firm and unchanged.

General conditions in iron and steel scrap markets are unchanged.



... Two railroads to buy rail tonnages.

o o o

... Pig iron melt continues at a high rate.

ST. LOUIS, June 15.—United States District Judge Davis has authorized the St. Louis-Southwestern Railway to purchase approximately 23 miles of 112-lb. rail to be laid between Illmo and Rockview and between Zeta and

Dexter Junction. The track is used jointly by the Missouri-Pacific Railroad, which is to pay approximately half of the cost.

The Missouri-Kansas-Texas Railway is said to be contemplating the purchase of an indetermined tonnage 112-lb. rails.

Atlas Iron Works has been awarded 500 tons of structural shapes for the St. Louis armory.

Steel mills affected by strikes continue to mark time, orders being booked subject to conditions. Consumers are reported to be most lenient, and there have been few cancellations.

Melt of pig iron in the district continues at a high rate. Foundries catering to the electrical manufacturing trade are extremely busy, following a letdown during strikes. Stove plants in the Belleville district are working at top speed five days a week on orders for fall delivery, which will begin early in August. Since the books were opened for third quarter shipment there has been a fair amount of buying by smaller concerns which had not made long-term plans and by larger concerns which had not bought sufficient tonnage.



... Cleveland furnaces are still rationing pig iron.—Rerollers need semi-finished steel.

LONDON, June 15 (By Cable).—Rationing supplies to home consumers, Cleveland furnaces are heavily sold and are refusing to consider export offers. All available furnaces are operating. Export deliveries of hematite are heavily in arrears, and buyers are unsuccessfully bidding up to 160s. Fuel and ore costs are rising.

Rerollers are still needing semi-finished supplies, and are unable to cope with all their own business.

Delayed deliveries of heavy steel are holding up constructional work. Export demand is intensified, and suppliers are endeavoring to increase order books.

The Continental steel market is less active as the summer season goes forward, and delivery delays will shorten to two to four months. Some prices are now only official rates plus obligatory premiums,

but no reduction in official prices is anticipated as costs are rising.

On July 1 the cartel will resume levy on members who are exporting in excess of quotas, which was temporarily removed in April. The Steel Cartel and the Rail Cartel will meet in Paris on July 21 and 22.

The tin plate market is more active both for home and export trade. Export buyers are pressing for fairly early shipment and prices are advancing as costs increase. British price on tin plate is 25s. to 25s. 6d.

Continental prices are unchanged.



Concord, N. H., has awarded 100 tons of 8-in. class 200 pipe to United States Pipe & Foundry Co.

Franklin, Tenn., will begin work soon on pipe lines for water system and other waterworks installation. Bond issue of \$30,000 has been arranged. Marr & Holman, Stahlman Building, Nashville, Tenn., are consulting engineers.

Clarkesville, Tenn., has plans for pipe lines for extensions in water system and other waterworks installation. Cost about \$350,000, of which \$157,000 is being secured through Federal grant. Thomas H. McAllen, 65 McCall Street, and Robert H. Hoshall, 789 North Evergreen Street, both Memphis, Tenn., are consulting engineers.

Arlington County Board of Supervisors, Clarendon, Va., Frank C. Hanrahan, County manager, plans two 20-in. pipe lines for water supply across new chain bridge of Government. Cost about \$46,000.

Durham, N. C., plans pipe lines for extensions in water systems and other waterworks installation. Fund of \$72,000 is being arranged through Federal aid. Department of Public Works, H. M. Kueffner, director, is in charge.

Belle Center, Ohio, plans pipe lines for water system; also elevated steel tank and tower and pumping station equipment. Fund of \$85,000 has been arranged through Federal aid.

Upper Arlington, Ohio, plans pipe lines for extensions in water system. Fund of \$487,000 is being arranged through Federal aid for this and extensions in sewers and street work, of which about \$136,000 will be used for material purchases.

Hatton, N. D., plans pipe lines for water system; also 50,000-gal. steel standpipe, pumping equipment and other waterworks installation.

Reading, Kan., plans pipe lines for water system and other waterworks installation. Cost about \$34,000. Financing is being arranged through Federal aid. Emporia Engineering Co., Emporia, Kan., is consulting engineer.

Corcordia, Kan., plans about 3140 ft. of 6 and 8-in. for extensions in pipe lines for water system; also installation of electric-operated pumping machinery and other waterworks equipment. J. O. Wolfe is city engineer.

Phillipsburg, Mont., plans pipe lines for water system, including main line to Fred Burr Lake, about eight miles distant, for trunk supply. Bond issue of \$68,000 has been voted.



...NON-FERROUS...

... London quotations sag; prices here hold steady.

... Seasonal doldrums and strike situation keep market quiet.

... Tin inactive as prices break.

NEW YORK, June 15.—London commodity prices broke wildly this morning, many metals establishing new lows. Reliable sources credit this upset to three primary factors: The financial crisis in France; the steel

strikes in this country, which seem to have a more pronounced effect upon foreign markets than upon domestic exchanges; and the general seasonal slowing down of industry.

The Week's Prices. Cents Per Pound for Early Delivery

	June 9	June 10	June 11	June 12	June 14	June 15
Electrolytic copper, Conn.*	14.00	14.00	14.00	14.00	14.00	14.00
Lake copper, N. Y.	14.125	14.125	14.125	14.125	14.125	14.125
Straits tin, spot, New York.	55.875	55.40	55.50	54.625	54.625	54.625
Zinc, East St. Louis.	6.75	6.75	6.75	6.75	6.75	6.75
Zinc, New York.	7.10	7.10	7.10	7.10	7.10	7.10
Lead, St. Louis.	5.85	5.85	5.85	5.85	5.85	5.85
Lead, New York.	6.00	6.00	6.00	6.00	6.00	6.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.

†Noon price.

Aluminum, virgin 99 per cent plus 20.00c.-21.00c. a lb., delivered.

Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.

Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.

Antimony, Asiatic, 14.75c. a lb., prompt, f.o.b., New York.

Quicksilver, \$96.00 to \$98.00 per flask of 76 lb.

Brass ingots, commercial 85-5-5-5, 14.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.	56.00c. to 57.00c.
Tin, bar.	59.25c. to 60.25c.
Copper, Lake.	15.00c. to 16.00c.
Copper, electrolytic.	15.00c. to 16.00c.
Copper, castings.	14.75c. to 15.75c.
*Copper sheets, hot-rolled.	21.62 ½c.
*High brass sheets.	19.50c.
*Seamless brass tubes.	22.25c.
*Seamless copper tubes.	22.37 ½c.
*Brass rods.	16.00c.
Zinc, slabs.	8.00c. to 9.00c.
Zinc, sheets (No. 9), casks, 1200 lb. and over.	13.75c.
Lead, American pig.	7.00c. to 8.00c.
Lead, bar.	8.00c. to 9.00c.
Lead, sheets, cut.	10.50c.
Antimony, Asiatic.	14.50c.
Alum., virgin, 99 per cent plus.	24.30c.
Alum., No. 1 for remelting, 98 to 99 per cent.	19.50c. to 21.00c.
Solder, ½ and ½.	36.50c. to 38.50c.
Babbitt metal, commercial grade.	25.00c. to 65.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33 ⅓ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.	58.875c.
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Tin, bar.	60.875c.
Copper, Lake.	15.00c. to 15.25c.
Copper, electrolytic.	15.00c. to 15.25c.
Copper, castings.	14.75c. to 15.00c.
Zinc, slabs.	8.75c. to 9.00c.
Lead, American pig.	6.50c. to 6.75c.
Lead, bar.	10.00c.
Antimony, Asiatic.	16.50c.
Babbitt metal, medium grade.	23.125c.
Babbitt metal, high grade.	63.50c.
Solder, ½ and ½.	37.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.	11.125c.	11.875c.
Copper, hvy. and wire.	10.50c.	11.00c.
Copper, light and bottoms.	9.50c.	9.75c.
Brass, heavy.	6.25c.	6.875c.
Brass, light.	5.00c.	5.75c.
Hvy. machine composition.	9.37 ½c.	9.87 ½c.
No. 1 yel. brass turnings.	7.37 ½c.	7.87 ½c.
No. 1 red brass or compos. turnings.	9.00c.	9.50c.
Lead, heavy.	4.75c.	5.12 ½c.
Cast aluminum.	12.12 ½c.	13.25c.
Sheet aluminum.	13.25c.	14.75c.
Zinc.	3.75c.	4.12 ½c.

Copper

Inasmuch as the strike situation is growing in severity, most consumers are avoiding any buying activity. What buying does exist is credited chiefly to fabricators associated with the producers. Sales for the week were 5209 tons. July and August are being sold most frequently, although some September sales have been reported. Domestic price for the electrolytic grade remained at 14c., delivered Connecticut. How long this price can be maintained in face of continually diminishing consumer interest, and the competition of the new lows on the London market, is a matter of conjecture. Asked prices in London this morning were reported as being at 13.45c.

Lead

Although figures are not yet available, it is estimated that May deliveries will be in excess of 50,000 tons, at a conservative estimate. Fresh buying on the part of battery makers, and the pigment and oxide trades, in the earlier part of the week gave the lead market a satisfactory volume of business, making up for a quiet market on Thursday and Friday. June requirements of the metal are about 75 per cent covered, with June 40 per cent sold. Domestic prices remained constant at 5.85c., St. Louis, and 6c., New York. London quotations dropped to a new low this morning, when futures were quoted at 4.62c. and prompt at 4.64c.

Zinc

Declines in the London market this morning constitute a serious threat to domestic sales. With the British price at 4.85c., some buyers here may be tempted to go abroad for coverage, but the fact that very little, if any, spot metal is available over there will undoubtedly keep such tonnages very low. Sales of prime western for the week amounted to 2960 tons, and undelivered contracts 59,406 tons.

Tin

Buying was practically nil in the tin market this week, and will probably continue along this line until the steel strikes are settled. Straits metal prices declined steadily the entire week, with the metal being quoted today at 54.625c., New York, a decline of 1.375c. from last week's price position. So many mills are postponing deliveries that the piling up of unsold stocks may reduce the backardation condition existing today. September and October deliveries are quoted currently at 0.375c. under prompt deliveries. British quotations, following the lead of copper, zinc, and lead, on first call today dropped to £243 for prompt metal, and £242 10d. for futures.



IRON AND STEEL SCRAP

... Dullness prevails in all markets and prices are largely nominal.

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... Composite price hits new low of \$17.08.

JUNE 15.—Because of the strike situation, both buyers and sellers of scrap have adopted a cautious attitude and are making few commitments. Even markets far removed from the struck areas are reflecting the apathy of the mills. Hence most markets are weaker, but the feeling prevails that prices may make an immediate advance upon settlement of the strikes. Based upon a moderate sized tonnage of No. 1 steel sold at Pittsburgh, the price for that grade is off 50c. a ton, as is also the case at Philadelphia because of a weaker market undertone. No. 1 steel at Chicago remains unchanged. The composite figure now touches a new low for the year of \$17.08. Some strength has been exhibited in blast furnace grades and prices have advanced 50c. at Pittsburgh and Cleveland, in the latter city on the basis of a 1000-ton sale to the Central blast furnace, recently taken over by American Steel & Wire Co. New export business is lacking, except at Boston, where No. 1 steel is selling at \$16 delivered to dock.

Pittsburgh

The continuance of strike disturbances in other localities has to some extent produced a "sympathetic" effect on the local market. Although the amount of scrap which has been diverted to this district is small, nevertheless both buyers and sellers appear to be apprehensive concerning the future trend of the market. Undeniably, should the strike situation clear up, prices would stand a good chance of becoming firmer and might even advance. Within the past week a moderate sized tonnage of No. 1 steel was sold into consumption at \$18.50, off 50c. from the previous sale. Some dealers have picked up No. 1 in small lots at \$18.25. Despite these factors, railroad heavy melting steel has recently commanded \$20 a ton. Under the circumstances, No. 1 heavy melting steel is off 50c. a ton, making it quotable at \$18 to \$18.50. With some pig iron producers pushing production, blast furnace grades are in

greater demand and are bringing higher prices.

Chicago

Of major interest to this strike-dominated market is the fact that scrap shipments into the plant of the Carnegie-Illinois Steel Corp. in Gary, began June 15, after a period of two or three weeks when this movement was suspended. Prices are still nominal, but there is a feeling among brokers that a great many items cannot now be bought at present levels and that when the strike is settled, rising prices will be almost certain.

Philadelphia

A weak undertone continues to dominate this market, and steel-making grades have been marked down 50c. a ton. The possibility of strikes tying up consumers in this territory is foremost in everyone's mind, and such a development would probably drive prices to considerably lower levels almost immediately. In view of the market tone, no district mill can see any advantage in taking on new commitments now, although several have quietly extended existing contracts at levels in line with quoted prices.

Cleveland

Approximately 1000 tons of blast furnace scrap was purchased by the American Steel & Wire Co. at a reported price of about \$12.75 for delivery to the Central blast furnaces in Cleveland, the operation of which this company recently took over from the Carnegie-Illinois Steel Corp. This is the first scrap purchase for Cleveland by this company in several years. This purchase has resulted in an advance of 50c. a ton on blast furnace scrap for which brokers are paying \$12.50 to \$12.75. Steel making scrap is inactive, but recent quotations are being maintained in spite of the holding up of shipments by struck plants.

Boston

Aside from small purchases of No. 1 steel at \$14.75 a ton delivered, and of No. 2 steel at \$13.25 by the American Steel & Wire Co., Worcester, and scattered buying of No. 1 machinery

cast by foundries at \$17 to \$18 a ton generally, and occasionally, where the freight rate is high, at \$19 a ton, the domestic market is virtually at a standstill. There has been and still is a good turnover in No. 1 steel for export at \$16 a ton delivered dock, and in No. 2 steel at \$15.

New York

Dullness continues to prevail in the local market. There have been no important sales to consumers in the past week, and with no real test to go by, prices are unchanged and purely nominal. Dealers see no change in sight until the steel mill strikes are settled. No new export business is reported, but shipments are going forward at a faster pace. As a result, the congestion in the harbor has been considerably reduced.

St. Louis

Because of limited sales of scrap iron to steel mills in the St. Louis industrial district, prices made by dealers are nominal. Strikes in other centers are holding back shipments, and it is difficult to gage the market. Selected heavy and No. 1 heavy melting steel are 50c. a ton less than the preceding week. St. Louis-San Francisco Railway has issued a list of 8500 tons.

Cincinnati

Old materials buying is all but absent from the market. Mill apathy is apparent, and labor disturbances in other areas tend to depress the market. Dealers are wary of long positions, and very little scrap is changing hands. Prices are undisturbed in the absence of test, but the undertone is definitely weak.

Buffalo

According to mills, material is flowing freely into local yards, and low-priced scrap is available. At the plant of one large consumer, no space is available for incoming scrap barges along the concern's docks, and barges are being held in Buffalo, awaiting their turn to unload. This plant reports recently having received as many as 60 cars of scrap in one day. Some No. 1 heavy melting steel has been sold at \$17.50, and some No. 2 at \$15.50. The buyer paid \$15.50 for drop forge flashings and \$14.50 for old bundles.

Detroit

Buying has been halted by the largest consumer in the Detroit area, supposedly because labor trouble is anticipated. Other scrap consumers locally also are out of the market fearing effects of strikes and because they have adequate stocks for present needs. Brokers feel an undercurrent of strength, however, and are paying quoted prices. Scrap yard labor trouble has been averted, and final agreement is expected Thursday. Wage rates agreed upon by the union and a special dealers' committee are in line with those commonly paid in Detroit yards, but some small operators will be forced to boost wages.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$18.00 to \$18.50
Railroad hvy. mltng.	19.50 to 20.00
No. 2 hvy. mltng. steel.	16.00 to 16.50
No. 2 RR. wrought	18.00 to 18.50
Scrap rails	20.50 to 21.00
Rails 3 ft. and under	25.00 to 25.50
Comp. sheet steel	18.50 to 19.00
Hand bundled sheets	16.50 to 17.00
Hvy. steel axle turn.	16.50 to 17.00
Machine shop turn.	14.00 to 14.50
Short shov. turn.	14.50 to 15.00
Mixed bor. & turn.	14.50 to 15.00
Cast iron borings	14.50 to 15.00
Cast iron carwheels	19.00 to 19.50
Hvy. breakable cast.	14.50 to 15.00
No. 1 cupola cast.	18.00 to 18.50
RR. knuckles & cplrs.	24.00 to 24.50
Rail coil & leaf springs	24.00 to 24.50
Rolled steel wheels	24.00 to 24.50
Low phos. billet crops	25.00 to 25.50
Low phos. sh. bar	24.00 to 24.50
Low phos. punchings	22.50 to 23.00
Low phos. plate, hvy.	23.50 to 24.00
Low phos. plate clips	21.50 to 22.00
Steel car axles	24.50 to 25.00

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$17.00 to \$17.50
No. 2 hvy. mltng. steel.	16.00 to 16.50
Comp. sheet steel	16.50 to 17.00
Light bund. stampings	12.50 to 13.00
Drop forge flashings	15.50 to 16.00
Machine shop turn.	11.00 to 11.50
Short shov. turn.	12.00 to 12.50
No. 1 busheling	15.50 to 16.00
Steel axle turnings	13.50 to 14.00
Low phos. billet and bloom crops	23.50 to 24.50
Cast iron borings	12.50 to 13.00
Mixed bor. & turn.	12.50 to 13.00
No. 2 busheling	12.50 to 13.00
No. 1 cast	19.00 to 19.50
Railroad grate bars	11.50 to 12.00
Stove plate	9.50 to 10.00
Rails under 3 ft.	23.00 to 23.50
Rails for rollings	21.00 to 21.50
Railroad malleable	20.50 to 21.00
Cast iron carwheels	21.50

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$17.00 to \$17.50
No. 2 hvy. mltng. steel.	15.00 to 15.50
Hydraulic bund., new	18.00 to 18.50
Hydraulic bund., old	14.50 to 15.00
Steel rails for rolling	21.00 to 21.50
Cast iron carwheels	19.50 to 20.00
Hvy. breakable cast.	18.00 to 18.50
No. 1 cast	20.00 to 20.50
Stove plate (steel wks.)	14.00 to 14.50
Railroad malleable	19.00 to 19.50
Machine shop turn.	13.00 to 13.50
No. 1 blast furnace	12.00 to 12.50
Cast borings	12.50 to 13.00
Heavy axle turnings	15.00 to 15.50
No. 1 low phos. hvy.	23.50 to 24.00
Couplers & knuckles	23.50 to 24.00
Rolled steel wheels	23.00 to 23.50
Steel axles	25.50 to 26.00
Shafting	23.50 to 24.00
No. 1 RR. wrought	19.50 to 20.00
Spec. iron & steel pipe	16.50 to 17.00
No. 1 forge fire	16.00 to 16.50
Cast borings (chem.)	14.00 to 14.50

CHICAGO

Delivered to Chicago district consumers:	
	Per Gross Ton
Hvy. mltng. steel.	\$15.50 to \$16.00
Auto. hvy. mltng. steel, alloy free	14.50 to 15.00
No. 2 auto. steel	12.00 to 12.50
Shoveling steel	15.50 to 16.00
Hydraul. comp. sheets	14.50 to 15.00
Drop forge flashings	13.50 to 14.00
No. 1 busheling	14.50 to 15.00
Rolled carwheels	19.50 to 20.00
Railroad tires, cut	21.50 to 22.00
Railroad leaf springs	21.00 to 21.50
Steel coup. & knuckles	19.50 to 20.00
Axle turnings	15.00 to 15.50
Coil springs	22.00 to 22.50
Axle turn. (elec.)	15.50 to 16.00
Low phos. punchings	20.00 to 20.50
Low phos. plates, 12 in. and under	20.00 to 20.50
Cast iron borings	10.00 to 10.50
Short shov. turnings	10.50 to 11.00
Machine shop turn.	8.50 to 9.00
Rerolling rails	19.00 to 19.50
Steel rails under 3 ft.	19.50 to 20.00
Steel rails under 2 ft.	20.00 to 20.50
Angle bars, steel	19.00 to 19.50
Cast iron carwheels	18.00 to 18.50
Railroad malleable	19.00 to 19.50
Agric. malleable	15.50 to 16.00

	Per Net Ton
Iron car axles	\$24.50 to \$25.00
Steel car axles	21.50 to 22.00
No. 1 RR. wrought	14.00 to 15.00
No. 2 RR. wrought	14.00 to 15.00
No. 2 busheling, old	8.50 to 9.00
Locomotive tires	18.00 to 18.50
Pipes and flues	13.50 to 14.00
No. 1 machinery cast.	15.00 to 15.50
Clean auto. cast.	14.00 to 14.50
No. 1 railroad cast.	14.00 to 14.50
No. 1 agric. cast.	13.00 to 13.50
Stove plate	10.50 to 11.00
Grate bars	12.00 to 12.50
Brake shoes	11.00 to 11.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:	
No. 1 hvy. mltng. steel.	\$17.00 to \$17.50
No. 2 hvy. mltng. steel.	15.50 to 16.00
Scrap rails	18.50 to 19.00
New hvy. b'nded sheet	15.50 to 16.00
Old hydrual. bundles	15.00 to 15.50
Drop forge flashings	15.50 to 16.00
No. 1 busheling	15.50 to 16.00
Hvy. axle turnings	13.00 to 13.50
Machine shop turn.	11.00 to 11.50
Knuckles & couplers	20.00 to 21.00
Coil & leaf springs	20.00 to 21.00
Rolled steel wheels	20.00 to 21.00
Low phos. billet crops	20.50 to 21.00
Shov. turnings	12.00 to 12.50
Mixed bor. & turn.	10.50 to 11.00
Cast iron borings	10.50 to 11.00
Steel car axles	19.50 to 20.00
No. 1 machinery cast.	17.50 to 18.00
No. 1 cupola cast.	16.50 to 17.00
Stove plate	14.00 to 14.50
Steel rails under 3 ft.	20.50 to 21.50
Cast iron carwheels	16.50 to 17.00
Railroad malleable	18.50 to 19.00
Chemical borings	11.00 to 11.50

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$16.00 to \$16.50
Scrap steel rails	17.00
Short shov. turnings	9.00 to 10.00
Stove plate	10.00
Steel axles	18.00 to 19.00
Iron axles	16.50 to 18.00
No. 1 RR. wrought	13.00 to 15.00
Rails for rolling	18.00 to 20.00
No. 1 cast	16.00 to 18.00
Tramcar wheels	16.00 to 18.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:	
Selected hvy. steel	\$15.00 to \$15.50
No. 1 hvy. melting	15.00 to 15.50
No. 2 hvy. melting	13.50 to 14.00
No. 1 locomotive tires	18.50 to 19.00
Misc. stand.-sec. rails	16.75 to 17.25
Railroad springs	20.00 to 20.50
Bundled sheets	10.00 to 10.50
No. 2 RR. wrought	15.00 to 15.50
No. 1 busheling	12.00 to 12.50
Cast bor. & turn.	7.50 to 8.00
Rails for rolling	18.00 to 18.50
Machine shop turn.	9.00 to 9.50
Heavy turnings	12.00 to 12.50
Steel car axles	21.50 to 22.00
Iron car axles	22.00 to 22.25
No. 1 RR. wrought	12.00 to 12.50
Steel rails under 3 ft.	18.50 to 19.00
Steel angle bars	17.50 to 18.00
Cast iron carwheels	18.00 to 18.50
No. 1 machinery cast.	14.00 to 14.50
Railroad malleable	18.00 to 18.50
No. 1 railroad cast.	14.00 to 14.50
Stove plate	11.50 to 12.00
Agricul. malleable	12.50 to 13.00
Grate bars	12.00 to 12.50
Brake shoes	12.25 to 12.75

CINCINNATI

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$14.25 to \$14.75
No. 2 hvy. mltng. steel.	11.75 to 12.25
Scrap rails for mltng.	17.50 to 18.00
Loose sheet clippings	10.25 to 10.75
Hydraul. b'nded sheets	13.75 to 14.25
Cast iron borings	8.00 to 8.50
Machine shop turn.	8.50 to 9.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling	6.00 to 6.50
Rails for rolling	19.50 to 20.00
No. 1 locomotive tires	15.50 to 16.00
Short tails	19.50 to 20.00
Cast iron carwheels	14.50 to 15.00
No. 1 machinery cast.	14.00 to 14.50
No. 1 railroad cast.	14.00 to 14.50
Burnt cast.	9.50 to 10.00
Stove plate	9.50 to 10.00
Agricul. malleable	15.00 to 15.50
Railroad malleable	16.25 to 16.75
Mixed hvy. cast.	12.00 to 12.50

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00
Borings and turnings	10.00 to 10.50
Long turnings	9.25 to 9.75
Short shov. turnings	10.25 to 10.75
No. 1 machinery cast.	15.00 to 15.50
Automotive cast	15.50 to 16.00
Hydraul. comp. sheets	15.50 to 16.00
Stove plate	9.50 to 10.00
New factory bushel.	14.00 to 14.50
Old No. 2 busheling	9.50 to 10.00
No. 2 busheling (black fender stock)	11.50 to 12.00
Sheet clippings	10.50 to 11.00
Flashings	13.25 to 13.75
Low phos. plate scrap	14.50 to 15.00

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$18.00 to \$18.50
Hydraulic bundles	17.50 to 18.00
Machine shop turn.	12.50 to 13.00

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00
Hvy. breakable cast.	13.75 to 14.25
No. 1 machinery cast.	15.00 to 15.50
No. 2 cast	14.00 to 14.50
Stove plate	11.00 to 11.50
Steel car axles	24.50 to 25.50
Shafting	19.00 to 19.50
No. 1 RR. wrought	17.00 to 17.50
No. 1 wrought long.	16.00 to 16.50
Spec. iron & steel pipe	12.50 to 13.00
Rails for rolling	18.50 to 19.00
Clean steel turnings	9.00 to 9.50
Cast borings	9.50 to 10.00
No. 1 blast furnace	9.50 to 10.00
Cast borings (chem.)	12.00 to 12.50
Unprepar. yard scrap	9.00 to 9.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast.	\$17.50 to \$18.00
No. 1 hvy. cast cupola	15.00 to 15.50
No. 2 cast	14.50 to 15.00

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$13.30
Scrap rails	13.30
No. 2 steel	12.25
Breakable cast.	13.10
Machine shop turn.	\$9.00 to 9.50
Mixed bor. & turn.	9.00 to 9.50
Bund. skeleton long.	11.75
Shafting	18.00 to 18.50
Cast bor. chemical	9.50 to 10.25
Per gross ton delivered consumers' yards:	
Textile cast	\$17.00 to \$19.00
No. 1 machine cast.	18.00 to 19.00
Stove plate	10.00 to 10.50

CANADA

Dealers' buying prices at their yards, per gross ton	
	Toronto Montreal
No. 1 hvy. mltng. stl.	\$12.50 \$13.00
No. 2 hvy. mltng. stl.	11.50 12.00
Mixed dealers steel	11.00 11.75
Scrap pipe	10.00 9.75
Steel turnings	8.00 8.50
Cast borings	9.25 9.50
Machinery cast.	16.00 17.00
Dealers cast.	14.00 15.00
Stove plate	12.00 12.75

EXPORT

Dealers' buying prices per gross ton:	
New York, truck lots, delivered, bargas.	
No. 1 hvy. mltng. steel.	\$15.00
No. 2 hvy. mltng. steel.	14.00
No. 2 cast	13.00
Stove plate	11.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel.	\$16.00
No. 2 hvy. mltng. steel.	15.00
Rails (scrap)	16.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel	\$17.00*
No. 2 hvy. mltng. steel	15.00*

* Nominal.

New Orleans, f.a.s.,

Stuyvesant Dock

No. 1 hvy. mltng. steel.	\$17.50
No. 2 hvy. mltng. steel.	16.50
Los Angeles, on cars or trucks at local piers	
No. 1 hvy. mltng. steel.	\$10.50 to \$11.00
Compressed bundles	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton
 Rerolling\$37.00
 Forging quality 43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
 Open-hearth or Besse-
 mer\$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngs-
 town, Buffalo, Coatesville, Pa., Spar-
 rows Point, Md.

Per Lb.
 Grooved, universal and
 sheared2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton
 F.o.b. Pittsburgh or Cleveland.....\$47.00
 F.o.b. Chicago, Youngstown or
 Anderson, Ind. 48.00
 F.o.b. Worcester, Mass. 49.00
 F.o.b. Birmingham 50.00
 F.o.b. San Francisco 56.00
 F.o.b. Galveston 53.00
 Rods over 9/32 in. to 47/64 in., in-
 clusive, \$5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.
 F.o.b. Pittsburgh 2.45c.
 F.o.b. Chicago or Gary 2.50c.
 F.o.b. Duluth 2.60c.
 Del'd Detroit 2.60c.
 F.o.b. Cleveland 2.50c.
 F.o.b. Buffalo 2.55c.
 Del'd Philadelphia 2.74c.
 Del'd New York 2.78c.
 F.o.b. Birmingham 2.60c.
 F.o.b. cars dock Gulf ports... 2.85c.
 F.o.b. cars dock Pacific ports... 3.00c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh 2.30c.
 F.o.b. Cleveland, Chicago, Gary
 or Moline, Ill. 2.35c.
 F.o.b. Buffalo 2.40c.
 F.o.b. Birmingham 2.45c.
 F.o.b. cars dock Gulf ports... 2.70c.
 F.o.b. cars dock Pacific ports... 2.85c.

Billet Steel Reinforcing
 (Straight lengths as quoted by
 distributors)

F.o.b. Pittsburgh 2.55c.
 F.o.b. Buffalo, Cleveland,
 Youngstown, Chicago, Gary
 or Birmingham 2.60c.
 Del'd Detroit 2.70c.
 F.o.b. cars dock Gulf ports... 2.95c.
 F.o.b. cars dock Pacific ports... 2.95c.

Rail Steel Reinforcing
 (Straight lengths as quoted by
 distributors)

F.o.b. Pittsburgh 2.40c.
 F.o.b. Buffalo, Cleveland,
 Youngstown, Chicago, Gary
 or Birmingham 2.45c.
 F.o.b. cars dock Gulf ports... 2.80c.
 F.o.b. cars dock Pacific ports... 2.80c.

Iron

F.o.b. Chicago 2.40c.
 F.o.b. Pittsburgh (refined) 3.60c.

Cold Finished Bars and Shafting*

Base per Lb.
 F.o.b. Pittsburgh 2.90c.
 F.o.b. Cleveland, Chicago and
 Gary 2.95c.
 F.o.b. Buffalo 3.00c.
 F.o.b. Detroit 2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.
 F.o.b. Pittsburgh 2.25c.
 F.o.b. Chicago or Gary 2.30c.
 Del'd Cleveland 2.435c.
 F.o.b. Coatesville or Spar. Pt. 2.35c.
 Del'd Philadelphia 2.435c.
 Del'd New York 2.53c.
 F.o.b. Birmingham 2.40c.

F.o.b. cars dock Gulf ports... 2.65c.
 F.o.b. cars dock Pacific ports... 2.80c.
 Wrought iron plates, f.o.b.
 Pittsburgh 3.80c.

Floor Plates

F.o.b. Pittsburgh 3.80c.
 F.o.b. Chicago 3.85c.
 F.o.b. Coatesville 3.90c.
 F.o.b. cars dock Gulf ports... 4.20c.
 F.o.b. cars dock Pacific ports... 4.35c.

Structural Shapes

Base per Lb.
 F.o.b. Pittsburgh 2.25c.
 F.o.b. Chicago 2.30c.
 Del'd Cleveland 2.435c.
 F.o.b. Buffalo or Bethlehem... 2.35c.
 Del'd Philadelphia 2.455c.
 Del'd New York 2.5025c.
 F.o.b. Birmingham (standard) 2.40c.
 F.o.b. cars dock Gulf ports... 2.65c.
 F.o.b. cars dock Pacific ports... 2.80c.

Steel Sheet Piling

Base per Lb.
 F.o.b. Pittsburgh 2.60c.
 F.o.b. Chicago or Buffalo 2.70c.
 F.o.b. cars dock Gulf or Pacific
 Coast ports 3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than
 60 lb., per gross ton\$42.50
 Angle bars, per 100 lb. 2.80

F.o.b. Basing Points

Light rails (from billets) per
 gross ton\$43.00
 Light rails (from rail steel) per
 gross ton 42.00

Base per Lb.
 Spikes 3.15c.
 Tie plates, steel 2.30c.
 Tie plates, Pacific Coast ports.. 2.40c.
 Track bolts, to steam railroads. 4.35c.
 Track bolts, to jobbers, all sizes
 (per 100 counts) 65-5 per cent off list

Basing points on light rails are Pittsburgh,
 Chicago and Birmingham; on spikes and tie
 plates, Pittsburgh, Chicago, Portsmouth, Ohio,
 Weirton, W. Va., St. Louis, Kansas City,
 Minneapolis, Colo., Birmingham and Pacific Coast
 ports; on tie plates alone, Steelton, Pa.,
 Buffalo; on spikes alone, Youngstown, Lebanon,
 Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.
 No. 10, f.o.b. Pittsburgh 2.40c.
 No. 10, f.o.b. Gary 2.50c.
 No. 10, del'd Detroit 2.60c.
 No. 10, del'd Philadelphia 2.69c.
 No. 10, f.o.b. Granite City 2.60c.
 No. 10, f.o.b. Birmingham 2.55c.
 No. 10, f.o.b. cars dock Pacific
 ports 2.95c.
 No. 10 wrought iron, Pgh. 4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh 3.15c.
 No. 24, f.o.b. Gary 3.25c.
 No. 24, del'd Detroit 3.35c.
 No. 24, del'd Philadelphia 3.44c.
 No. 24, f.o.b. Granite City 3.35c.
 No. 24, f.o.b. Birmingham 3.30c.
 No. 24, f.o.b. cars dock Pacific
 ports 3.80c.
 No. 24, wrought iron, Pitts-
 burgh 5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh. 3.10c.
 No. 10 gage, f.o.b. Gary 3.20c.
 No. 10 gage, f.o.b. Detroit 3.30c.
 No. 10 gage, del'd Philadelphia. 3.39c.
 No. 10, f.o.b. Granite City 3.30c.
 No. 10 gage, f.o.b. Birmingham. 3.25c.
 No. 10 gage, f.o.b. cars dock
 Pacific ports 3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh.. 3.55c.
 No. 20 gage, f.o.b. Gary 3.65c.
 No. 20 gage, del'd Detroit 3.75c.
 No. 20 gage, del'd Philadelphia. 3.84c.
 No. 20, f.o.b. Granite City 3.75c.
 No. 20 gage, f.o.b. Birmingham. 3.70c.
 No. 20 gage, f.o.b. cars, dock,
 Pacific ports 4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh. 3.80c.
 No. 24, f.o.b. Gary 3.90c.
 No. 24, del'd Philadelphia 4.09c.
 No. 24, f.o.b. Granite City 4.00c.

No. 24, f.o.b. Birmingham 3.95c.
 No. 24, f.o.b. cars, dock, Pacific
 ports 4.40c.
 No. 24, wrought iron, Pitts-
 burgh 6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.
 Field grade 3.35c.
 Armature 3.70c.
 Electrical 4.20c.
 Special Motor 5.10c.
 Special Dynamo 5.80c.
 Transformer 6.30c.
 Transformer Special 7.30c.
 Transformer Extra Special 7.80c.

Base gage changed from 28 to 24 gage. Gage
 extras are the same as those applying on hot-
 rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus sil-
 icon sheet extra width extras plus 25c. per 100
 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating
 f.o.b. Pittsburgh 4.10c.
 F.o.b. Gary 4.20c.
 F.o.b. cars, dock, Pacific ports 4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh 3.50c.
 No. 20, f.o.b. Gary 3.60c.
 No. 20, f.o.b. Granite City 3.70c.
 No. 20, f.o.b. cars dock Pacific
 ports 4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per
 lb. 3.30c.
 No. 28, Gary 3.40c.
 No. 28, f.o.b. Granite City 3.50c.
 No. 28, cars dock Pacific ports,
 boxed 4.175c.

Tin Plate

Base per Box
 Standard cokes, f.o.b. Pitts-
 burgh district mill\$5.35
 Standard cokes, f.o.b. Gary 5.45
 Standard coke, f.o.b. Granite
 City 5.55

Above quotations practically the
 equivalent of previous quotations
 owing to new method of quoting,
 effective Jan. 1, 1937.

Special Coated Manufacturing Ternes

Base per Box
 F.o.b. Pittsburgh*\$4.65
 F.o.b. Gary * 4.75
 F.o.b. Granite City 4.85

* Customary 7 1/2 per cent discount in effect
 through 1936 discontinued as of Jan. 1, 1937.

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
 8-lb. coating I.C.\$11.00
 15-lb. coating I.C. 13.00
 20-lb. coating I.C. 14.00
 25-lb. coating I.C. 15.00
 30-lb. coating I.C. 16.25
 40-lb. coating I.C. 18.50

Hot-Holled Hoops, Bands, Strip and Flats under 1/4 In.

Base per Lb.
 All widths up to 24 in., Pitts-
 burgh 2.40c.
 All widths up to 24 in., Chicago 2.50c.
 All widths up to 24 in., del'd
 Detroit 2.60c.
 All widths up to 24 in., Granite
 City 2.60c.
 All widths up to 24 in.,
 Birmingham 2.55c.
 Cooperage stock, Pittsburgh... 2.50c.
 Cooperage stock, Chicago 2.60c.

Cold-Rolled Strip*

Base per Lb.
 F.o.b. Pittsburgh 3.20c.
 F.o.b. Cleveland 3.20c.
 Del'd Chicago 3.48c.
 F.o.b. Worcester 3.40c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

Pittsburgh
 and
 Cleveland Worcester
 Carbon 0.25-0.50% 3.20c. 3.40c.
 Carbon .51-.75 4.45c. 4.65c.
 Carbon .76-1.00 6.30c. 6.50c.
 Carbon Over 1.00 8.50c. 8.70c.

Fender Stock

No. 14, Pittsb'gh or Cleveland 3.45c.
 No. 20, Pittsb'gh or Cleveland. 3.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)
To Manufacturing Trade

Per Lb.
Bright wire2.90c.
Spring wire3.50c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade

Base per Keg
Standard wire nails\$2.75
Smooth coated nails\$2.75
Cut nails, carloads\$3.60

Base per 100 Lb.

Annealed fence wire\$3.20
Galvanized fence wire3.60
Polished staples3.45
Galvanized staples3.70
Barbed wire, galvanized3.40
Twisted barbed wire3.40
Woven wire fence, base column. 74
Single loop bale ties, base col. 63

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh
District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld		Wrought Iron	
In.	Black Galv.	In.	Black Galv.
1/4	52 31	1/4 & 3/8	+13 +35
1/4 to 3/8	55 38 1/2	1/2	20 1 1/2
1/2	59 1/2 49	3/4	26 8
3/4	62 1/2 53	1 & 1 1/4	30 14
1 to 3	64 1/2 55 1/2	1 1/2	34 16 1/2
		2	33 1/2 16
Lap Weld		Welded	
In.	Black Galv.	In.	Black Galv.
2	57 47 1/2	2	26 1/2 10
2 1/2 & 3	60 50 1/2	2 1/2 to 3 1/2	27 1/2 12 1/2
3 1/2 to 6	62 52 1/2	4	29 1/2 16
7 & 8	61 50 1/2	4 1/2 to 8	28 1/2 15
9 & 10	60 1/2 50	9 to 12	24 1/2 10
11 & 12	59 1/2 49		

Butt Weld, extra strong, plain ends
1/450 1/2 36 1/2
1/4 to 3/852 1/2 40 1/2
1/257 1/2 48 1/2
3/461 1/2 52 1/2
1 to 363 55

Lap Weld, extra strong, plain ends
255 46 1/2
2 1/2 & 359 50 1/2
3 1/2 to 662 1/2 54
7 & 861 1/2 51
9 & 1060 1/2 50
11 & 1259 1/2 49

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold Drawn	Hot Rolled
1 in. o.d.	13 R.W.G. \$ 9.46	\$ 8.41
1 1/4 in. o.d.	13 R.W.G. 11.21	9.98
1 1/2 in. o.d.	13 R.W.G. 12.38	11.00
1 3/4 in. o.d.	13 R.W.G. 14.09	12.51
2 in. o.d.	13 R.W.G. 15.78	14.02
2 1/4 in. o.d.	13 R.W.G. 17.60	15.83
2 1/2 in. o.d.	13 R.W.G. 19.37	17.21
2 3/4 in. o.d.	12 R.W.G. 21.22	18.85
3 in. o.d.	12 R.W.G. 22.49	19.98
3 1/4 in. o.d.	12 R.W.G. 23.60	20.97
3 1/2 in. o.d.	10 R.W.G. 45.19	40.15
3 3/4 in. o.d.	11 R.W.G. 29.79	26.47
4 in. o.d.	10 R.W.G. 36.96	32.82
5 in. o.d.	9 R.W.G. 56.71	50.38
6 in. o.d.	7 R.W.G. 87.07	77.35

Extra for less-carload quantities:
25,000 lb. or ft. to 39,999 lb. or ft. 5 %
12,000 lb. or ft. to 24,999 lb. or ft. 12 1/2 %
6,000 lb. or ft. to 11,999 lb. or ft. 25 %
2,000 lb. or ft. to 5,999 lb. or ft. 35 %
Under 2,000 lb. or ft.50 %

CAST IRON WATER PIPE

Per Net Ton
*6-in. and larger, del'd Chicago. \$55.00
6-in. and larger, del'd New York 53.00
6-in. and larger, Birmingham. 47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles.... 56.00
F.o.b. dock, Seattle..... 56.00
4-in., f.o.b. dock, San Francisco or Los Angeles 59.00
F.o.b. dock, Seattle 59.00

Class "A" and gas pipe, \$3 extra.
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$46, Birmingham, and \$54 delivered Chicago; and 4-in. pipe, \$49, Birmingham, and \$58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
1/2 in. x 6 in. and smaller.65 and 5*
Larger and longer up to
1 in.60 and 10*
1 1/4 in. and larger.....60 and 5*
Lag bolts60 and 10*
Plow bolts, Nos. 1, 2, 3
and 765 and 5
Hot pressed nuts, and c.p.c.
and t nuts, square or hex.
blank or tapped:
1/2 in. and smaller..... 65
9/16 in. to 1 in. inclusive...60 and 5
1 1/4 in. and larger 60

Jobbers discount on above items, 5 per cent.

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:

1/2 in. and smaller60 and 10
9/16 in. to 1 in. inclusive..60 and 5
1 1/4 in. and larger 60
Stove bolts in packages, nuts attached72 1/2
Stove bolts in packages, with nuts separate72 1/2 and 5
Stove bolts in bulk..... 80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lbs.
F.o.b. Pittsburgh or Cleveland..\$3.60
F.o.b. Chicago or Birmingham.. 3.70

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh65 and 5
F.o.b. Cleveland65 and 5
F.o.b. Chicago and Birmingham65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller 75
Milled headless set screws, cut thread 3/4 in. and smaller..... 75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller 60
Upset set screws, cup and oval points 75
Milled studs 65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base3.00c.
Delivered, Detroit3.15c.

S.A.E. Alloy Differential
Numbers per 100 lb.
200 (1 1/2% Nickel) \$0.35
2100 (1 1/2% Nickel) 0.75
2300 (3 1/2% Nickel) 1.55

2500 (5% Nickel) \$2.25
3100 Nickel-chromium 0.70
3200 Nickel-chromium 1.35
3300 Nickel-chromium 3.80
3400 Nickel-chromium 3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum). 0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum). 0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni.) 1.10
5100 Chrome steel (0.60-0.90 Cr.) 0.35
5100 Chrome steel (0.80-1.10 Cr.) 0.45
5100 Chromium spring steel.... 0.15
6100 Chromium-vanadium bar... 1.20
6100 Chromium-vanadium spring steel 0.85
Chromium-nickel-vanadium ... 1.50
Carbon-vanadium 0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars .....25c.		24c.
Plates .....29c.		27c.
Structural shapes .	25c.	24c.
Sheets .....36c.		34c.
Hot-rolled strip ..	23.50c.	21.50c.
Cold-rolled strip ...	30c.	28c.
Drawn wire .....25c.		24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars ..18.50c.		19c.	22.50c.	27.50c.
Plates ..21.50c.		22c.	25.50c.	30.50c.
Sheets ..26.50c.		29c.	32.50c.	36.50c.
Hot strip 17c.		17.50c.	23c.	28c.
Cold stp. 22c.		22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed 67c
High-carbon-chrome 43c
Oil-hardening 24c.
Special 22c.
Extra 18c.
Regular 14c.
Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export£20 Nominal
Tin plate, per base box 24s. to 25s
Steel bars, open-hearth.....£11
Beams, open-hearth.....£10 12s. 6d.
Channels, open-hearth.....£10 12s. 6d.
Angles, open-hearth£10 12s. 6d.
Black sheets, No. 24 gage£15
Galvanized sheets, No. 24 gage£18 15s.

CONTINENTAL

Per Metric Ton, Gold £.
f.o.b. Continental Ports

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.
Billets, Thomas£4 7s. 6d.
Wire rods, No. 5 B.W.G.....£5 2s. 6d.
Steel bars, merchant£5
Sheet bars£4 8s. 6d.
Plate 1/4 in. and up.....£6 7s.
Plate 3/16 in. and 5 mm..£6 13s.
Sheet, 1/4 in.£7 9s. 6d.
Beams, Thomas£4 18s.
Angles (Basic)£4 18s.
Hoops and strip, base£6

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Per Net Ton
Plates	3.70c.
Structural shapes	3.70c.
Soft steel bars and small shapes	3.80c.
Reinforcing steel bars	3.80c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs 3.90c.
	Per Cent Off List
Track bolts, all sizes, per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'l'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

**Prices on application.

CHICAGO Base per Lb.

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	4.40c.
Track bolts (keg lots)	5.60c.
Rivets, structural (keg lots)	4.60c.
Rivets, boiler (keg lots)	4.70c.
	Per Cent Off List
Machine bolts	*60
Carriage bolts	*60
Lag screws	*55 and 5
Hot-pressed nuts, sq. tap or blank	*60
Hot-pressed nuts, hex. tap or blank	*60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c't'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. char-coal	6.50 to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.
Hoops	4.32c.

Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.50 to 4.82c.
Galvanized sheets (No. 24*)	5.00 to 5.72c.
Long terme sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.60c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretcher leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, ½ in. and heavier	5.90c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.35c.
Wire, galv. (No. 9)	4.60c.
Tire steel, 1 x ½ in. and larger	4.11c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	\$3.40

	Per Cent Off List
Machine bolts, square head and nut:	
All diameters. Prices on application	
Carriage bolts, cut thread:	
All diameters. Prices on application	

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.
†125 lb. and more.

ST. LOUIS Base per Lb.

Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	4.94c.
Boiler rivets	5.04c.

	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts: all quantities	65

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base Per Lb.
*Plates, ¼-in. and heavier	3.80c.
*Structural shapes	3.80c.
*Soft steel bars, small shapes, iron bars (except bands)	3.90c.
†Reinforc. steel bars, sq. twisted and deformed	3.21c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.25c.
*Steel bands, No. 12 and 3/16 in. incl.	4.00c.
Spring steel	5.40c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	3.90c.
Diam. pat. floor plates, ¼ in.	5.45c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.
†For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.

Soft steel bars	3.75c.
†Reinforc. steel bars	2.60c.
†Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'l'd wire, per 100 lb.	\$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
	Per Cent Off List
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count	
½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

†Outside delivery 10c. less.

*For 5000 lb. or less.

†Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI Base per Lb.

Plates and struc. shapes	3.95c.
Floor plates	5.85c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	\$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg: Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35

	Net per 100 Ft.
Seamless steel boiler tubes,	
2-in.	\$21.80
4-in.	52.45
Lap-welded steel boiler tubes,	
2-in.	20.73
4-in.	48.41

BUFFALO Base per Lb.

Plates	3.92c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg (2500-lb lots or under)	\$3.21
Black wire, base per 100 lb. (Over 2500 lb.)	4.55c.

BOSTON Base per Lb.

Channels, angles	4.20c.
Tees and zeos, under 3"	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, ¼ thick and heavier	4.08c.
Floor plates, diamond pattern	6.03c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)*	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.
Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.	

* Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	4.81c.
Boiler rivets, cone head (keg lots)	4.91c.
Track spikes (keg lots)	4.61c.
Track bolts (keg lots)	5.81c.
Black annealed wire (No. 6 to No. 9 incl.)	4.05c.
Com. wire nails and cement coated nails	
1 to 14 kegs	3.25c.

Per Cent Off List

Machine bolts and carriage bolts, 1/2x6 and smaller or shorter 65	
Larger and longer up to 1 in. diam.	60-5
1 1/4 in. and larger	60
Coach and lag screws	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.	50
200 lb. and over:	
1/2 in. and smaller	65
9/16 to 1 in.	60-5
1 1/4 in. and over	50-10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

Base per Lb.

Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons.	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates 1/4 in. and heavier	5.80c.
Galvanized sheets, No. 24, 100 bdis. or more	\$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	\$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.96c.
Iron bars	3.96c.
Reinforcing bars	3.96c.
Structural shapes	4.01c.
Plates	4.01c.
Hot-rolled sheets No. 10	3.91c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.76c.
Steel bands	4.16c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

Base per Lb.

Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	4.35c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	60

NEW ORLEANS

Base per Lb.

Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	\$3.30
Bolts and nuts, per cent off list	60

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	3.625c.
Hot-rolled annealed sheets (No. 24)	5.15	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel			
Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	\$3.65	\$3.60	\$3.70

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00
5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.	

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50
5 per cent trade discount on silica brick.	

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

Per Net Ton

Standard f.o.b. Baltimore and Chester, Pa.	\$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash.	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.27
Delivered Newark or Jersey City	26.39
Delivered Philadelphia	25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.07
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered San Francisco, Los Angeles or Seattle	25.00
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.51
Delivered Canton, Ohio	24.76
Delivered Mansfield, Ohio	25.26
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	\$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.39
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago.	24.50
F.o.b. Birmingham	25.50
Delivered Cincinnati	25.51
Delivered Canton, Ohio	25.76
Delivered Mansfield, Ohio	26.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$28.50
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Gray Forge

Valley or Pittsburgh furnace	\$23.50
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Charcoal

Lake Superior furnace	\$27.00
Delivered Chicago	30.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Per Gross Ton	
Domestic, 80% (carload)	\$102.50

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	\$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	\$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50
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For each additional 0.5% silicon up to 17%, 50c. a ton is added.
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.
Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%	\$33.50
10.51 to 11.00%	34.00
11.01 to 11.50%	34.50
11.51 to 12.00%	35.00
12.01 to 12.50%	35.50
12.51 to 13.00%	36.00
13.01 to 13.50%	36.50
13.51 to 14.00%	37.00
14.01 to 14.50%	37.50
14.51 to 15.00%	38.00
15.01 to 15.50%	38.50
15.51 to 16.00%	39.00
16.01 to 16.50%	39.50
16.51 to 17.00%	40.00

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del. carloads	\$1.70
Ferrotungsten, lots of 5000 lb.	\$1.75
Ferrotungsten, smaller lots	\$1.80
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.50c.*
Ferrochromium, 2% carbon	16.50c. to 17.00c.*
Ferrochromium, 1% carbon	17.50c. to 18.00c.*
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.*
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.*
Ferrovanadium, del. per lb. contained V	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	\$2.50*
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	\$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	\$45.00
Ton lots or less, per ton	50.00
Silico-manganese, gross ton, delivered.	
3%	101.50
2.50% carbon grade	106.50
2% carbon grade	111.50
1% carbon grade	121.50

* Spot prices are \$5 a ton higher. Spot premium on 75 per cent ferrosilicon is \$10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10

Mesabi, non-Bessemer, 51.50%	\$4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	Nominal
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed	45c.
Man., African, Indian, 44-48%	Nominal
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48½%	Nominal

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	\$22.00 to \$24.00
Tungsten, domestic, scheelite delivered	Nominal
Chrome ore (lump) c.i.f. Atlantic Seaboard, per net ton:	
South African	\$16.00
Rhodesian, 45%	23.00
Rhodesian, 48%	25.00
Turkish, 48-49%	24.50 to \$25.00
Turkish, 45-46%	20.50 to 21.00
Turkish, 44%	19.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:	
52%	\$25.50 to \$26.00
50%	24.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$19.00 to \$20.00
Domestic, barge and rail	19.50 to 21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00 to 21.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	5.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	5.25c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.75c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	\$4.60 to \$4.75
Foundry, f.o.b. Connellsville, Prompt	5.25 to 6.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.85 to 11.30
Foundry, by-product, Philadelphia	10.60
Foundry, by-product, delivered Cleveland	11.00
Foundry, by-product, delivered Cincinnati	10.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45



FABRICATED STEEL

... Lettings in smaller volume at 15,600 tons compared with 24,650 tons last week.

o o o

... New projects decline to 14,750 tons from 18,950 tons a week ago.

NORTH ATLANTIC STATES

Milford, Mass., 180 tons, State bridge, to Bethlehem Steel Corp.

Harpersville, N. Y., 350 tons, State bridge, to American Bridge Co.

Rochester, N. Y., 450 tons, boiler extension, Rochester Gas & Electric Co., to Belmont Iron Works, Philadelphia.

Buffalo, 300 tons, addition to National Aniline & Chemical Co., to Ernst Iron Works, Buffalo.

Etna, Pa., 650 tons, stock house alterations and additions, Spang-Chalfant & Co., to Pittsburgh Bridge & Iron Co.

Philadelphia, 150 tons, short beams for Reading Railroad viaduct, to American Fabricated Steel Co., Philadelphia.

Harrisburg, Pa., 160 tons, building steel for WPA, to Pittsburgh Bridge & Iron Co.

Ford City, Pa., 155 tons, Pittsburgh Plate Glass furnace hall, to Pittsburgh Bridge & Iron Co.

Baltimore, 140 tons, U. S. Industrial Alcohol Co., to Maryland Steel Products Co.

Annapolis, Md., 500 tons, radio towers and repairs, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

SOUTH AND SOUTHWEST

Waynesboro, Va., 160 tons, high school, to Roanoke Iron & Bridge Co., Roanoke, Va.

Kenova, W. Va., 175 tons, bridge, to Ben-Tom Supply Co.

Lexington, Ky., 145 tons, University of Kentucky unit, to Louisville Bridge & Iron Co.

Anchorage, Ky., 250 tons, administration building, Catholic Diocese of Kentucky, to Louisville Bridge & Iron Co., Louisville, Ky.

Pickett County, Tenn., 170 tons, highway bridge, to Vincennes Bridge Co., Vincennes, Ind.

Memphis, Tenn., 110 tons, Immaculate Conception Church, to Pidgeon-Thomas Iron Co., Memphis.

Augusta, Ga., 150 tons, Sears-Roebuck store, to Southern Engineering Co.

Palm Beach County, Fla., 300 tons, Flagler Memorial Bridge, to Nashville Bridge Co.

New Orleans, 275 tons, Phoenix Engineering Corp. turbine room extension, to Jones & Laughlin Steel Corp.

Purcell, Okla., 2350 tons, South Canadian River bridge, to J. B. Klein Iron & Foundry Co. and Capitol Steel & Iron Co., both Oklahoma City.

CENTRAL STATES

Riverview, Mich., 1250 tons, factory, Firestone Steel Products Co., to American Bridge Co.

Detroit, 125 tons, addition, Michigan Bell Telephone Longfellow exchange, to American Bridge Co.

Detroit, 325 tons, alterations and additions to warehouse, Chrysler Corp., to Whitehead & Kales.

State of Illinois, 170 tons, bridge, to Milwaukee Bridge Co.

La Grange, Ill., 2525 tons, Electro-Motive Corp. plant addition, to American Bridge Co.

Ottawa, Ill., 235 tons,lehr and cullet building, Libbey-Owens-Ford Glass Co., to Mississippi Valley Structural Steel Co.

East St. Louis, Ill., 150 tons, Armour & Co. boiler house, to Duffin Iron Co., Chicago.

St. Paul, Minn., 1025 tons, sheep pens, St. Paul Stock Yards, to St. Paul Foundry Co.

State of North Dakota, 305 tons, underpass, to American Bridge Co.

Barry County, Mo., 155 tons, White River bridge, to Reynolds Mfg. Co.

St. Louis, 500 tons, municipal armory, to Atlas Iron Works, St. Louis.

WESTERN STATES

Denver, 560 tons, seven bridges, to an unnamed bidder.

Miles City, Mont., 210 tons, two bridges, to Minneapolis-Moline Power Implement Co., Minneapolis.

Olney, Mont., 110 tons, bridge, to American Bridge Co.

Belton, Mont., 255 tons, State bridge, to Minneapolis-Moline Power Implement Co.

Victor, Idaho, 400 tons, highway bridge, Department of Agriculture, to Minneapolis-Moline Power Implement Co.

San Francisco, 180 tons, Standard Oil stacks, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Canaan, Conn., 230 tons, State bridge.

Haverhill, Mass., 153 tons beams, Government work.

Uxbridge, Mass., 100 tons, State bridge.

State of Massachusetts, 300 tons, bridges; bids until June 22.

New York, 6500 tons, covering Christopher Columbus high school, Bronx; Lafayette high school, Brooklyn, and public school 191, Brooklyn; bids until June 24.

New York, 1020 tons, Whitestone-Bronx bridge; Frederick Snare Corp., contractor.

Buffalo, 350 tons, gymnasium for University of Buffalo; bids June 22.

Philadelphia, 750 tons, high school at Ogontz and Olney Avenues; bids June 22.

Westmoreland-Armstrong Counties, Pa., 560 tons, bridge; bids June 18.

Pottstown, Pa., 400 tons, bridge; bids July 1.

New Kensington, Pa., 960 tons, storage building, Aluminum Co. of America.

State of New Jersey, 235 tons, bridges on route 35, section 13; bids June 28.

Woodbridge, N. J., 260 tons, State highway bridges.

Baltimore, 400 tons, blending and bottling plant, Hunter-Baltimore Rye Distillery.

THE SOUTH

Fetterman, W. Va., 950 tons, State overhead crossing, No. 1422.

Louisville, Ky., 500 tons, bridge.

CENTRAL STATES

Detroit, tonnage unstated, Chrysler Corp. assembly plant.

Cleveland, 300 tons, theater building, Warner Brothers.

Chicago, 340 tons, warehouse, Bosworth Building Corp.

Chicago, 500 tons, post office garage.

Moline, Ill., 840 tons, highway bridge, route 80, section 115-F.

WESTERN STATES

Cheyenne, Wyo., 120 tons, railroad over crossing on Shoshoni-Casper Road; bids June 22.

FABRICATED PLATES

AWARDS

Wisconsin Rapids, Wis., 195 tons, two digesters, to Manitowoc Boiler Works.

Eureka, Cal., 60,000 ft. of 24 and 30-in. steel pipe for Mad River water supply project, to United Concrete Pipe Co.

Los Angeles Metropolitan Water District, 10,000 ft. of 14-in. black steel pipe, to American Pipe & Steel Co.

NEW PROJECTS

Bourne, Mass., 100 tons, Buzzards Bay Water District, water tank.

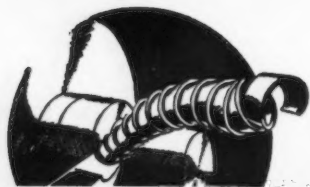
South Chicago, 800 tons, soaking pits for Carnegie-Illinois Steel Corp.

Hammond, Ind., 600 tons, tank and stand.

SHEET PILING

AWARDS

New Orleans, 430 tons, Market Street power house, to Carnegie-Illinois Steel Corp.



THIS WEEK'S MACHINE ... TOOL ACTIVITIES...

... Mixed trends are noticeable in machinery buying, as strikes create uncertainty in some areas.

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... Detroit firm gets order for 1000 machines for New Jersey rayon plant.

o o o

... Buyers are resisting attempts to hedge on price on long term shipments.

Detroit

A \$1,000,000 program for a New Jersey rayon plant, which will open next March 1, has resulted in the placing of orders for 1000 units with a Detroit company, and bids are being asked for a 21x14-ft. combined milling and drilling machine to handle the frames on the thousand jobs. It is also reported that this new project has resulted in the placing of heavy orders with manufacturers of specialties which will be used on the new equipment. Buying is still heavy at the Ford Motor Co. Rouge plant, but there has been one case where a sizable program was dropped suddenly and without explanation after the union began its drive on Ford. Generally, however, the reaction is that labor difficulties must become very severe at the Rouge before it will have any effect on buying programs there. The seasonal effect is still making itself felt in the machine tool field, but inquiries and orders are still ahead of normal.

Chicago

ORDERS and inquiries for machine tools are being maintained at about last week's level, although July and August may see a lessening in demand. With the exception of the International Harvester development in Indianapolis, which, incidentally, is expected to run closer to \$6,000,000 in cost than the \$4,000,000 reported last week, industrial construction is inactive. The Bendix Aviation Corp., which buys in this district, has announced proposals for the enlargement of its aviation and automobile facilities on the West Coast. Railroads continue quiet. Prices are firm, with general opinion favoring a reduction in present levels rather than a further increase. One seller, who was quoting tools requiring over four months for shipment subject to a 12½ per cent increase, has dropped this provision altogether from his quotations. Strikes

throughout the Middle West have, in some instances, held up tool builders and made deliveries even worse. It has been heard that one manufacturer of fractional-horsepower motors is running over a year behind on orders already booked. This situation, which is paralleled to a lesser degree in other parts shops, has had much to do with holding up tool shipments.

Cincinnati

DEMAND for machine tools in this area is easing. Average market business the past week was less than in the preceding week. It is widely remarked that labor uncertainties combined with a natural consumer let-down after the brisk previous periods are probably the chief contributing causes. Bookings are from both domestic and foreign sources, but orders are for single units. Of course, if plants are able to continue operations unhampered by labor difficulties, the current slack will afford opportunity to clear backlogs and reduce the gap between consumer requirements and present shipping dates.

Production was also reduced the past week by a strike in Hamilton. This, however, was short-lived, work being resumed after a day's walkout. Elsewhere in the district factory operations are steady at current peaks with advance schedules indicating no let-up.

Cleveland

STRIKES in the steel and other industries are having a very depressing effect on the machine tool market, particularly in the immediate territory. Sales and inquiries have further declined, and the volume of business during June is expected to be considerably less than during May. An exception to the general trend is the demand for multiple-spindle drilling machines. There is now a brisk demand from the motor car industry for these machines,

largely of special types that were quiet a few months ago when the machinery market was unusually active. Deliveries of machine tools in a few cases have been held up pending settlements of strikes, but there have been scarcely any cancellations. As manufacturers have good backlogs, they are not expressing any concern over the falling off in sales.

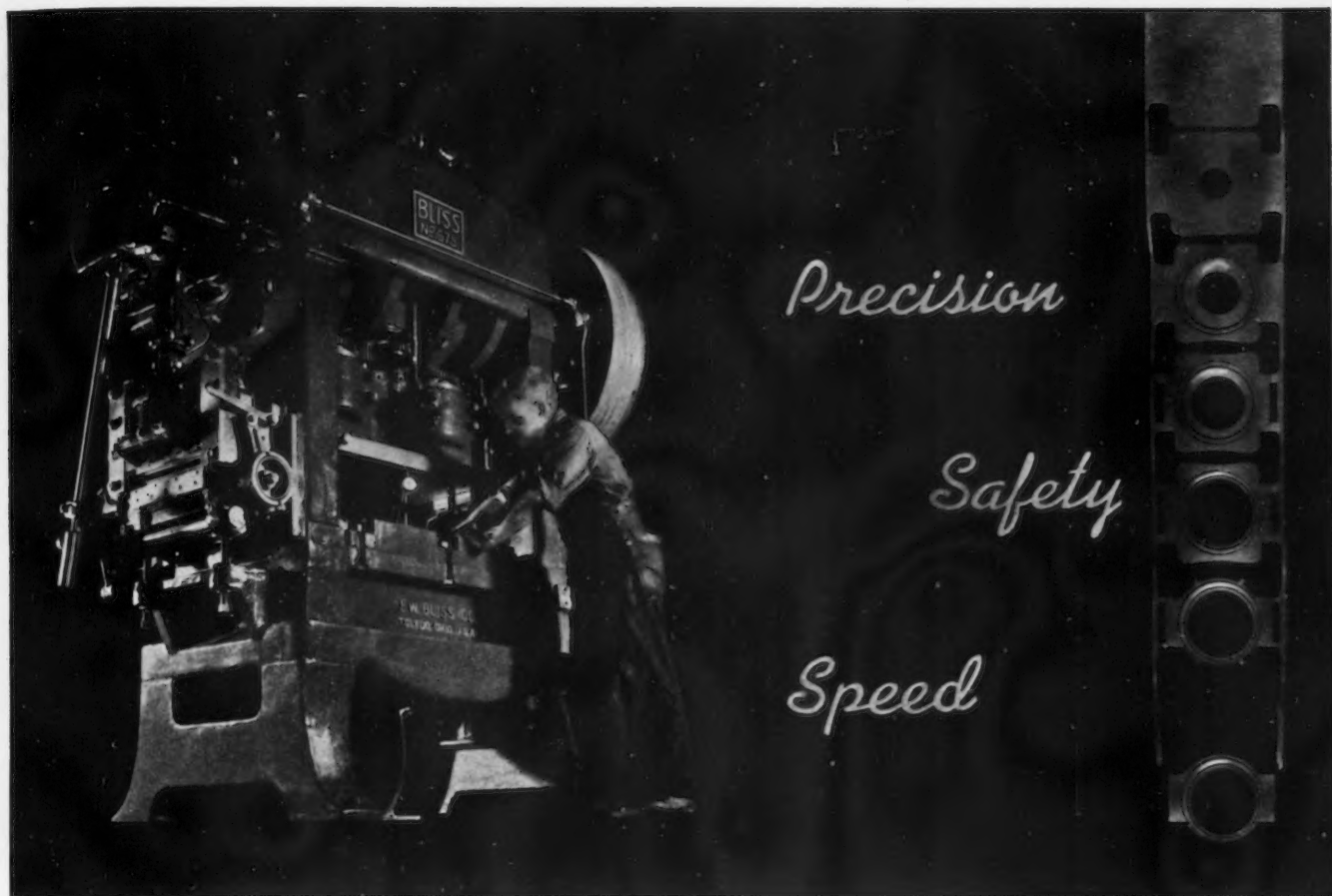
New York

ORDERS and inquiries are continuing in good volume from scattered sources and in one-machine lots. Among these is a fair percentage of what amounts to unsolicited business from new companies or concerns that have not bought a machine since the beginning of the depression. The question of deliveries is the uppermost problem facing dealers and factory representatives these days. In a few weeks, few machines will be quotable for shipment before the end of the year. Machinery manufacturers hesitate to place a price on machinery that will not be fabricated until four or five months from now, at what labor and material costs no one can tell. Some have sought to protect themselves against rising costs by stipulating in the sales contract that the price shall be the sales price prevailing 30 days prior to shipment, but in no case is the final price to exceed the original quotations plus some percentage, generally 12½ per cent. To firms that buy equipment on appropriations against a fixed budget, this is an unsatisfactory way of doing business.

Upstate buying leads. Buying for the General Motors steering gear plant at Syracuse, N. Y., has been considerably extended over original plans, and delivery preference is being given over other GM plants in order to get the equipment in by Sept. 1. The Delco division at Rochester is also actively in the market, and the Eclipse Machine division of Bendix Aviation, Elmira, N. Y., has bought a number of machines in recent weeks. American Locomotive Co., which has increased its force tenfold in the last six months, has also been adding machinery, and its neighbor in Schenectady, General Electric, remains a regular purchaser. The possible centralization of all activities of the Carrier Engineering Corp. to Syracuse is nearer a certainty by the raising of a \$250,000 fund by a local committee to provide factory space.

Pittsburgh

IF for no other reason than that inquiries had been exceptionally light, the volume in the past week shows a slightly better trend. A number of requests for data are coming from customers not heard from for some time. Orders are about on a par with the previous week and show normal activity except for those held up on account of strikes at steel plants. Activity in these specific instances will resume upon the reopening of the affected steel plants. Some machine tool manufacturing companies are accepting no more orders for 1937 delivery. Some machine tools are obtainable in 60 days, but the average delivery promise is much more extended.



"Bliss" High Production Press....No.	615	620	630	645	645B	645D	650	675	675B	6100	6100B	6150	6150A	6150B	6200
Rating, fine dies.....Tons	15	20	30	45	45	45	50	75	75	100	100	150	150	150	200
Design capacity.....Tons	20	27	40	65	65	65	75	110	110	125	125	190	190	190	250
Face of slide, f-b x r-l.....Inches	7x6 3/4	8x16 1/2	9x10	10x19 3/4	14x33	14x45	11x13	15x31	15x43	18x31	18x43	20x33 1/2	20x39 1/2	20x51	28x22
Bolster area, f-b x r-l.....Inches	14x9	14x19	18 1/2x13	18 1/2x23	18 1/2x36	18 1/2x48	24x17	27x36	27x48	28x36	28x48	36x41	36x47	36x59	36x28
Operating speed (normal max.)...S.P.M.	350	350	300	300	275	250	250	200	180	150	150	100	90	90	100

"Five times the Die Life"

"Fifty times the Man-hour Production"

Consistent reports such as these from the users of Bliss High Production Presses, are the logical result of the careful planning, the very thorough development and the precise manufacturing methods which made this line of such vital importance to American manufacturing methods.

Other Bliss Automatic Presses and mechanical feeding mechanisms are also available to you for the easy solution of any production problem.

Safety is inherent in idea of mechanical feeding; and incidentally you remove all of the nerve strain which handicaps hand feeding.

Power Presses
Automatic Presses
Hydraulic Presses

Rolling Mills and Accessories
Can Making Machinery
Dies, Accessory Equipment

E. W. BLISS COMPANY

Brooklyn, N. Y.
Cleveland, Ohio
Philadelphia, Pa.
New Haven, Conn.
London, England

Toledo, Ohio
Chicago, Ill.
Boston, Mass.
Paris, France

Detroit, Mich.
Hastings, Mich.
Rochester, N. Y.
Salem, Ohio
Turin, Italy

BLISS
Automatic Presses and Feeds



PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Johns-Manville Corp., 22 East Fortieth Street, New York, manufacturer of insulating materials, etc., has plans for new branch plant at Watts, near Los Angeles, where large tract has been acquired. Cost close to \$1,000,000 with equipment. Work on initial plant unit will begin soon. This is part of \$3,400,000 plant expansion and improvement program of company for 1937.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 22 for two 760-hp. marine gasoline engines and spare parts (Schedule 942) for Brooklyn Navy Yard; until June 25, 1200 discharge hose assemblies (Schedule 919) for Brooklyn and Mare Island yards; until June 29, 60-hp. electric motors and spare parts (Schedule 980) for New York and Puget Sound yards.

Fleer & Fleer, Inc., Bond and First Streets, Brooklyn, oils, coal, etc., will take bids at once for new bulk oil storage and distributing plant. Cost over \$100,000 with steel storage tanks, pumping station and other facilities. Edward M. Wharff, 489 Fifth Avenue, New York, is consulting engineer.

American Can Co., 230 Park Avenue, New York, has taken out building permit for one-story addition to branch plant at Tampa, Fla. Cost close to \$350,000 with equipment, which will provide for about 75 per cent increase in present capacity. C. G. Preis is chief engineer in charge.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for oil burners, feedwater heaters, pumps, storage tanks, combustion control equipment and miscellaneous equipment for power house at Naval Hospital, Brooklyn (Specifications 8418).

Linde Air Products Co., 30 East Forty-second Street, New York, has acquired about nine-acre tract at West River and French Creek Roads, near Lorain, Ohio, for new branch plant. Cost over \$200,000 with equipment. Superstructure will begin early in fall.

Board of Education, Scarsdale, N. Y., plans manual training department in new three-story senior high school, for which general contract was let recently to William A. Berbusse, Jr., Inc., 101 Park Avenue, New York. Cost about \$875,000. Rositer & Muller, 22 East Fortieth Street, New York, are architects.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until June 21 for 25 power units, 17 electric motors, six armatures for generators, four armatures for motor (Circular 192); until June 22, springs in lots of 2000 to 2500, switchboxes, insulators, etc. (Circular 194).

Rex Electric Mfg. Co., 264 Canal Street, New York, manufacturer of electric lamps and kindred electrical products, has leased floor in building at 476-78 Broome Street, for plant.

Town Commission, Montclair, N. J., plans early purchase of two electric-operated pumping units and auxiliary equipment for municipal water pumping station on Watching Avenue, with capacities of 4,000,000 to 6,000,000-gal. and 1,500,000 to 2,500,000-gal. per day, respectively.

State Purchase Commissioner, State House, Trenton, N. J., asks bids until June 21 for 45 brake testers, 45 wheel alignment indicators, 45 complete hydraulic-operated lifts and necessary power equipment, 45 headlight testers for motor vehicle inspection and testing.

United States Engineer Office, Philadelphia, asks bids until June 28 for one steel building at Fort Mifflin, Philadelphia (Circular 437).

Huffman-Wolfe Co., 11 West Rittenhouse Street, Philadelphia, manufacturer of piping, fittings, etc., with headquarters at Columbus, Ohio, has acquired former factory of Fox Gun Co., Eighteenth Street and Windrim Avenue, on site, 116 x 178 ft., for plant.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until June 21 for 21,200 brass screw eyes (Circular 799); until June 23, 2860 steel forgings (Circulars 777 and 778).

Philadelphia Electric Co., Philadelphia, has taken out permit for three-story addition to steam-electric generating plant at Schuylkill Avenue and Christian Street. Installation will include 50,000-kw. turbo-generator and auxiliary equipment. Cost about \$5,000,000.

◀ NEW ENGLAND ▶

Elliott Addressing Machine Co., 143 Albany Street, Cambridge, Mass., has let general contract to Canter Construction Co., 6 Beacon Street, Boston, for one-story top addition to present two-story plant unit, 60 x 212 ft. Cost over \$50,000 with equipment. Ganteaume & McMullen, 99 Chauncy Street, Boston, are engineers.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 22 for four punch presses (Circular 302), one tool cutter and grinder (Circular 301), operating rod springs (Circular 310); until June 23, one 3000-lb. portable floor crane, hand-operated, with safety friction brake (Circular 298), one jig boring machine (Circular 300), two 1000 lb. each motor-driven board drop hammers, and two 2000-lb. similar drop hammers (Circular 303).

International Silver Co., 48 State Street, Meriden, Conn., has asked bids on general contract for four-story addition to plant on Butler Street, 40 x 145 ft. Cost over \$100,000 with equipment.

City Council, Providence, R. I., has plans for 1300-ft. addition to municipal dock, including two-story storage and warehouse building, 200 x 600 ft., extension of railway lines, water pipe lines and other facilities, and installation of conveyers, hoists, loaders and other mechanical-handling equipment. Cost about \$2,000,000, of which \$1,100,000 has been authorized by city and remainder will be secured through Federal aid. Major S. Frank Nolan is city engineer.

◀ BUFFALO DISTRICT ▶

United States Engineer Office, Federal Building, Buffalo, asks bids until June 23 for two cast steel pump impellers, one cast steel socket and retaining ring, one cast steel ball joint elbow, two pump impellers and two cast steel throat liners (Circular 130); until June 22, 12 cast steel suction flanges (Circular 129).

Eastman Kodak Co., Rochester, N. Y., has let general contract to Ridge Construction Corp., Rochester, for eight-story and basement addition, 60 x 120 ft. Cost over \$250,000 with equipment. Company also has work under way on two other one-story units to cost over \$100,000, for which general contract was let recently to same contractor.

◀ SOUTH ATLANTIC ▶

International Harvester Co., 606 South Michigan Avenue, Chicago, is considering one-story factory branch, storage and distributing plant for harvesting machinery and implement division at Charlotte, N. C. Cost over \$40,000 with equipment.

Quincy Coca-Cola Bottling Co., Quincy, Fla., has acquired property at Calhoun and Crawford Streets for one-story mechanical-

bottling works, for which superstructure will begin soon. Cost about \$45,000 with equipment.

J. M. Tull Metal & Supply Co., 191-7 Marietta Street, Atlanta, Ga., metal products, has plans for two-story and basement addition, 98 x 200 ft. Award for excavations has been let to A. K. Adams Co., 542 Plum Street, N. W., which will also secure contract for superstructure. New unit will be used primarily for storage and distribution. Cost about \$85,000 with equipment. Robert & Co., Bona Allen Building, are architects and engineers.

◀ WASHINGTON DIST. ▶

Quartermaster, Marine Corp., Washington, asks bids until June 21 for one electric drill, tool steel machine bits, chisels, drills, hacksaw blades, vises, etc. (Schedule 957).

Bureau of Yards and Docks, Navy Department, Washington, asks bids until June 28 for aviation field and facilities at St. Thomas, V. I., including addition to hangar, extensions and improvements in power house, electrical system and other work (Specifications 8433).

Hunter Baltimore Rye Distillery, Inc., 405 West Redwood Street, Baltimore, has asked bids on general contract for one-story additions to distilling plant at Gwynnbrook, Md. Cost over \$75,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, Bridgeport, Conn., is architect and engineer.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until June 21 for hacksaw blades, steel bristle brushes, drills, dies, chisels, hammers, wrenches, pliers, screwdrivers, taps, calipers, combination vacuum and fuel pump testing gages and other tools (Proposal 398-203); until June 22, 151 3-cu. ft. per min. each gasoline-driven air compressors, 31 9-cu. ft. per min. electric air compressors, 30 20-cu. ft. per min. electric-driven air compressors (Proposal 398-205), metallic tubing, couplings, washers, water tanks, air compressor, switches, blower-type fans, etc. (Proposal 398-206); until June 23, 39 2-ton cranes, 83 1½-ton chain hoists, 83 2000-lb. platform warehouse trucks (Proposal 398-202), nine motor-testing dynamometers (Proposal 398-204).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 22 for four overhaul and assembly engine stands (Schedule 941); until June 25, motor-driven bench-type sensitive drill (Schedule 929), rough machined steel forgings (Schedule 962) for Eastern and Western Navy Yards; until June 22, one gasoline engine-driven rotating boom crane (Schedule 963) for Anacostia yard; 45 aluminum propeller blades (Schedule 950) for Philadelphia yard; until June 25, 49 steam-jacketed kettles, aluminum or corrosion-resisting (Schedule 920) for Sewall's Point and Mare Island yards; 40 pieced and welded steel head shells, and 40 seamless drawn steel head shells (Schedule 821) for Newport, R. I., Naval Station; one motor-driven, stationary air compressor (Schedule 936) for Long Beach station.

◀ WESTERN PA. DIST. ▶

Erie Railroad Co., Midland Building, Cleveland, plans one-story additions and installation of equipment in car reconstruction and repair shops at Dunmore, Pa. Cost over \$50,000. H. R. Adams is shop superintendent at Dunmore.

H. J. Hinz Co., 1062 Progress Street, Pittsburgh, food packer and canner, has plans for steam power house at new canning plant at Fremont, Ohio, on which work recently was begun. Cost about \$50,000 with boiler units, pumps and other equipment. Entire project will cost over \$400,000 with machinery.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has let contract to Des Moines Bridge & Iron Works, Neville Island, Pittsburgh, for structural steel for two additions to branch plant at Sharon, Pa., one and four stories, respectively, in part for storage and distribution. Cost close to \$400,000 with equipment.

◀ MICHIGAN DISTRICT ▶

Bopp Steel Corp., 7951 Maple Avenue, Dearborn, Mich., has let general contract to Austin Co., Curtis Building, for one-story addition, 82 x 160 ft. Cost over \$75,000 with equipment.

National Broach & Machine Co., 11455 Shoemaker Street, Detroit, plans expansion and improvements, including additional equipment. Company has arranged for

New Industrial Literature

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FRICTION CLUTCHES.—Carlyle Johnson Machine Co. Folder describing light powered, single and double type friction clutches. Sizes rated by a "Foot Pounds Torque" method. Lists revised prices and sizes. Bulletin 6-124.

GENERATORS AND GEAR REDUCERS.—Star Electric Motor Co. Bulletin covering a.c. and d.c. generators, motor generator sets, and gear reducers. Contains cut-away views, dimensional data, and ratings. Bulletin 6-125.

PLASTIC MOLDING.—Chicago Molded Products Corp. "The Story of Plastic Molding", an interestingly prepared booklet explaining the steps involved in making molded products. Has suggestions for designers, engineering data, and illustrations of stock items. Bulletin 6-126.

POWER PUMPS.—Fairbanks, Morse & Co. Folder illustrates self oiling power pumps. Cut-away drawing shows internal construction. Bulletin 6-127.

FLEXIBLE METAL TUBING.—The American Brass Co., Metal Hose Branch. Sixteen-page catalog describes the manufacture, use and maintenance of flexible metal hose. Catalog also covers American vibration eliminators and American "Bracketubes", showing their use with flexible metal hose. Bulletin 6-128.

MAINTENANCE FINISHES.—Everseal Mfg. Co. Bulletin announcing a new line of "Everseal" industrial finishes. Includes descriptions of floor finishes, heat resistant aluminum finishes, alcohol resistant varnish and various enamels. Finishes are fortified with bakelite resins. Bulletin 6-129.

PETROLEUM INDUSTRY.—Caterpillar Tractor Co. Booklet showing "Caterpillar" tractors performing miscellaneous tasks around the refinery and in the oil fields. Bulletin 6-130.

WELDING ELECTRODES.—Electroloy Co., Inc. A leaflet announcing two improvements in tapered spot welding electrodes—cold forming to increase hardness and plating to reduce oxidation. Bulletin 6-131.

SHEET HANDLING EQUIPMENT.—Cullen-Friestedt Co. Two bulletins illustrating sheet lifters, and portable gantry cranes designed for use with the lifters. Design permits locking the jaws of lifter in any desired position. Bulletin 6-132.

STAINLESS STEEL SPECIALTIES.—Peter A. Frasse & Co., Inc. A booklet describing stainless steel nuts, screws, pipe fittings, bolts, and other items.—Bulletin 6-133.

CORROSION RESISTING EQUIPMENT.—Duriron Co., Inc. Catalog describing a complete line of equipment designed for handling corrosive solutions. Gives dimensions, capacities and engineering data. Bulletin 6-134.

**LUBRICATION IN HONING AND LAP-
PING OPERATIONS.**—Standard Oil Co. (Indiana). Discussion of the processes and recommended lubricants. Bulletin 6-135.

AIR FILTERS.—Air-Maze Corp. A 9-page folder describing methods of installing air filters on automotive equipment. Also describes fittings used to adapt filters to various type motors. Contains formula for determining size of filter required for a given application. Bulletin 6-136.

GRINDING WHEELS.—Abrasive Co. A 112-page booklet which comprehensively discusses the various phases of grinding wheel use and maintenance. Contains dimensions of all standard wheels manufactured by them. Bulletin 6-137.

PLASTIC MATERIAL.—Beetle Products Division, American Cyanamid Co. Booklet illustrating actual application of Beetle plastic material in radio cabinets. Bulletin 6-138.

DRIVE CHAINS.—Baldwin-Duckworth Chain Corp. Catalog illustrates stainless steel and bronze drive chain for use in corrosive atmospheres. Also covers standard attachments for drive chains. Bulletin 6-139.

MICROSCOPES.—Bausch & Lomb Optical Co. 2 catalogs describing laboratory and polarizing microscopes and accessories. Contains complete details and prices. Has a page devoted to photomicrographic equipment used with polarizing microscopes. Bulletin 6-140.

MILLING MACHINES.—Brown & Sharpe Mfg. Co. A folder discussing climb milling, conventional milling and a combination of climb and conventional milling as applied to their electrically controlled milling machines. Bulletin 6-141.

VALVES AND FITTINGS.—Walworth Co. A bi-monthly magazine for engineers and executives. May issue carries an article on "Creep Testing of Metals", and other data on valves and fittings. Bulletin 6-142.

VARIABLE SPEED CONTROLLERS.—Reeves Pulley Co. 118 pages of data on the construction and application of the REEVES speed control equipment. Illustrated thruout and bound in red cloth. Bulletin 6-143.

CO₂ METERS.—Brown Instrument Co. Catalog describes CO₂ meters and their application. A schematic diagram illustrates the operating principle of the CO₂ meters manufactured by them. Bulletin 6-144.

DISC-BRAKE MOTORS.—Reliance Electric & Engineering Co. Loose leaf insert describing the construction and operation of their disc-brake motors. Gives torque ratings. Bulletin 6-145.

DUST COLLECTORS.—C. O. Bartlett & Snow Co. 33-page booklet illustrating "Oil Froth" collectors of the wet dust type. Contains technical data concerning installation of dust collectors, and illustrations of various applications. Bulletin 6-146.

LABORATORY EQUIPMENT.—Adolph I. Buehler. A booklet "The Metal Analyst", which describes in detail cutting machines, bakelite presses, bench grinders, polishers, microscopes, and photomicrographic equipment, for laboratory use. Bulletin 6-147.

DIESEL ENGINES.—Fairbanks-Morse & Co. Folder describes their new heavy duty engine for small power users. Gives dimensions. Bulletin 6-148.

METAL CLEANING.—American Foundry Equipment Co. A data book on "Wheelabrator" installations. Photographs and descriptive material give complete details. Bulletin 6-149.

*If you want your new catalog or literature listed here
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stock issue of 183,750 shares, part of proceeds to be used for purpose noted.

Timken-Detroit Axle Co., 100 Clark Street, Detroit, has let general contract to Barton-Malow Co., 1900 East Jefferson Street, for one-story top addition to present plant unit, 80 x 117 ft. Cost over \$65,000 with equipment.

Acme Industries, Inc., Jackson, Mich., manufacturer of pipe coils, water coolers, condensers and kindred equipment, has purchased part of former plant of American Fork & Hoe Co., and will remodel for new works to be ready for service in August. K. A. Weatherwax is secretary.

Barkley-Grow Aircraft Corp., Penobscot Building, Detroit, manufacturer of airplanes and parts, plans expansion and improvements in plant on French Road, including new equipment. Company has arranged for sale of stock to total about \$200,000, part of proceeds to be used for purpose noted.

Zenith Carburetor Co., 696 Hart Avenue, Detroit, has let general contract to Hazleton Clark Co., 150 West Fort Street, for one-story addition, primarily for storage and distribution. Cost over \$40,000 with equipment. Leonard Willeke, Grosse Pointe, Mich., is architect.

◀ OHIO AND INDIANA ▶

Frigidaire Division, General Motors Corp., Dayton, Ohio, manufacturer of electric refrigerators and parts, will take bids soon for two-story and basement addition, 80 x 700 ft., for initial unit of several new structures for other lines of production, including electric ranges and electric washing machines, and will make further additions to household appliance lines later. Plant extension noted will cost over \$1,500,000 with equipment. Entire project will represent investment of close to \$4,000,000. Schenck & Williams, Third National Bank Building, are architects. E. G. Biechler is general manager.

Columbus Conveyor Co., Goodale Street and Northwest Boulevard, Columbus, Ohio, has let general contract to George Reibel, 1782 Franklin Avenue, for one-story addition. Cost close to \$40,000 with equipment.

William Powell Co., 2525 Spring Grove Avenue, Cincinnati, manufacturer of valves and kindred engineering specialties, has let general contract to Penker Construction Co., 1030 Summer Street, for three-story addition, 80 x 150 ft. Cost about \$100,000 with equipment. Tietig & Lee, Inc., 34 West Sixth Street, is architect; A. M. Kinney, Inc., Carew Tower Building, is mechanical engineer.

City Auto Stamping Co., Lint Avenue, Toledo, Ohio, manufacturer of metal automobile stampings, has let general contract to Henry J. Spieker Co., 1418 Elm Street, for one-story and basement addition, 140 x 145 ft. Cost over \$100,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer. Company is affiliated with City Machine & Tool Co. and City Forge Co., both Toledo.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until June 23 for fuel pump assemblies, in lots of 200 to 450 (Circular 830).

Crosley Radio Corp., 1329 Arlington Avenue, Cincinnati, has acquired about 100-acre tract at Richmond, Ind., and will use part of site for branch plant for production of porcelain enameled refrigerator cabinets and allied specialties. Main unit will be one-story, 200 x 1200 ft., to be supplemented later with several smaller structures. Cost over \$750,000 with equipment.

Quartermaster, Fort Benjamin Harrison, Ind., asks bids until June 22 for valves, cocks, gaskets, washers, parts for heaters, boilers, tanks, etc. (Proposal 384-57).

Crawford Steel Foundry Co., Bucyrus, Ohio, has purchased entire foundry of former W. A. Riddell Co., instead of part of foundry, as reported in the May 27 issue of THE IRON AGE. Officers of company are: W. J. Michael, president; F. D. Glosser, vice-president and general manager, and J. C. Carroll, secretary, treasurer.

◀ SOUTH CENTRAL ▶

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 21 for 733,400 ft. of electric wire and cable, with accessory equipment for Pontotoc-Sardis power transmission line; until June 24, two 80-ton gantry cranes for spillway and intake gates, Pickwick Landing Dam.

Southern Metal Products Corp., Huntsville, Ala., manufacturer of enameled stoves and ranges, parts, etc., has plans for

two one-story additions, 20 x 200 ft., and 60 x 100 ft. A third one-story unit, 30 x 120 ft., will be built later. Cost over \$100,000 with equipment.

Board of Trustees, University of Kentucky, Lexington, Ky., has asked bids on general contract for two-story addition to engineering building, 58 x 230 ft. Installation will include forge and machine shops, mechanical and electrical laboratories. Cost about \$85,000 exclusive of equipment. University engineering department is in charge.

Birmingham Paper Co., Fifth Avenue South and Twenty-first Street, Birmingham, has let general contract to Southern Construction Co., 611 South Eleventh Street, for three-story and basement paper-converting plant on adjoining site, for manufacture of commercial paper products. Cost about \$175,000 with equipment. Charles H. McCauley, Jackson Building, is architect.

City Council, Monroe, La., plans extensions and improvements in municipal electric power plant, including additional equipment; also extensions in waterworks station and system, including pumping equipment, pipe lines, etc. Special election has been called July 8 to approve bond issue for \$1,500,000 for this and other municipal improvements.

◀ SOUTHWEST ▶

Missouri Pacific Railroad Co., St. Louis, has let general contract to J. J. Wuellner & Son, 101 Oak Street, Alton, Ill., for new engine house and shop unit at repair works, Atchison, Kan. Cost about \$65,000 with equipment.

Board of Education, 410 South Cincinnati Street, Tulsa, Okla., W. A. Melton, business manager, plans manual training department in new four-story Will Rogers high school, 250 x 390 ft., for which bids are being asked on general contract until July 1. Cost about \$1,300,000. A. M. Atkinson, Thompson Building, is supervising architect; Leon B. Senter and Joseph R. Koberling, Philtower Building, are associate architects.

Ozark Chemical Co., West Twenty-first Street, Tulsa, Okla., manufacturer of industrial chemicals, sulphuric acid, etc., has plans for one-story furnace building, 60 x 80 ft. Cost over \$75,000 with equipment.

Sinclair Refining Co., 2121 West Twenty-first Street, Tulsa, Okla., is considering new oil refinery at Portland, near Corpus Christi, Tex., where large tract has been secured. It will include steel tank storage division, power house, machine shop and other departments. Cost close to \$1,000,000 with equipment. Main offices of company are at New York.

Willacy County Water Control and Improvement District No. 1, 204 East Hidalgo Street, Raymondville, Tex., W. D. Woodruff, president, asks bids until June 25 for electric-operated pumping plant for water service in parts of Willacy and Hidalgo counties, totaling about 70,000 acres, including main supply canal system. Fund of \$560,000 has been arranged for entire project. W. E. Anderson is engineer.

Golman Baking Co., Park and Corinth Streets, Dallas, Tex., has plans for new two-story baking plant at South Ervay and McKee Streets, to include traveling ovens, conveyors, loaders and other mechanical-handling equipment. Cost about \$175,000 with machinery.

Cosden Petroleum Corp., Fort Worth, Tex., is considering new gasoline refinery, with steel tank storage and distributing facilities. Cost over \$85,000 with cracking machinery and other equipment.

◀ MIDDLE WEST ▶

International Harvester Co., 606 South Michigan Avenue, Chicago, Motor Truck Division, has purchased about 75-acre tract on Brookville Road, Indianapolis, for new plant for production of gasoline engines for company motor trucks. Initial plant will comprise two main one-story units, one a foundry, and other for general finishing, assembling, testing and other branches of production, totaling about 340,000 sq. ft. floor space. Cost about \$3,500,000 with equipment. American Bridge Co. has been awarded structural steel contract.

Cribben & Sexton Co., 680 North Sacramento Boulevard, Chicago, manufacturer of stoves, ranges and parts, has plans for one-story addition, 140 x 192 ft. Part of unit will be used for general production, and remainder for storage and distribution. Cost over \$100,000 with equipment. Arthur Swanson, Desplaines, Ill., is architect.

City Council, Webster City, Iowa, asks bids until July 5 for one 2000-kw. condensing steam turbo-alternator and accessories, one 30-kw. non-condensing steam turbine-driven exciter, one 3600-sq. ft. surface condenser and auxiliaries with auxiliary equipment for municipal electric power plant. Entire project will cost about \$130,000. E. R. Compton is city manager; H. E. Risner is plant superintendent.

McGraw Electric Co., 120 South LaSalle Street, Chicago, manufacturer of electric household appliances and kindred products, has asked bids on general contract for one-story and basement plant at Elgin, Ill. Cost about \$200,000 with equipment. Olson & Urbain, 228 North LaSalle Street, Chicago, are architects.

Electro-Motive Corp., La Grange, Ill., manufacturer of diesel engines, a division of General Motors Corp., has plans for one-story addition, 360 x 816 ft., primarily for manufacture of two-cycle engine units, including parts production and assembling. Cost close to \$1,000,000 with equipment.

Dobbins Mfg. Co., 1004 N. E. Charles Street, St. Paul, Minn., manufacturer of hardware, has asked bids on general contract for one-story addition and improvements in present plant. Cost close to \$40,000 with equipment.

General Foundries Co., 2570 North Thirty-second Street, Milwaukee, manufacturer of gray iron castings, which last November purchased two units of defunct Fuller-Warren Co. stove and range works it previously held under lease, is investing about \$35,000 in improvements, including cleaning room, pattern and carpenter shop, electric sub-station, etc.

Board of Education, Chippewa Falls, Wis., has rejected bids opened May 13 for machinery, tools and other equipment for new vocational institute and will take new bids until June 17. John J. Nibbe is secretary.

Wisconsin Axle Division, Oshkosh, Wis., of Timken-Detroit Axle Co., Detroit, contemplates erection of new unit, 70 x 100 ft., one-story, to double-reduction gear axle works.

◀ PACIFIC COAST ▶

Cudahy Packing Co., 803 Macy Street, Los Angeles, meat packer, has let general contract to Myers Brothers, 3407 San Fernando Road, for three-story addition, 87 x 87 ft., and improvements in present plant. Cost close to \$100,000 with equipment. C. Deuel, 405 Douglas Building, is engineer. Main offices of company are at Chicago.

Pacific Pump Co., 5715 Beckett Street, Huntington Park, Cal., manufacturer of pumping machinery and parts, has filed plans for one-story addition. Cost close to \$40,000 with equipment.

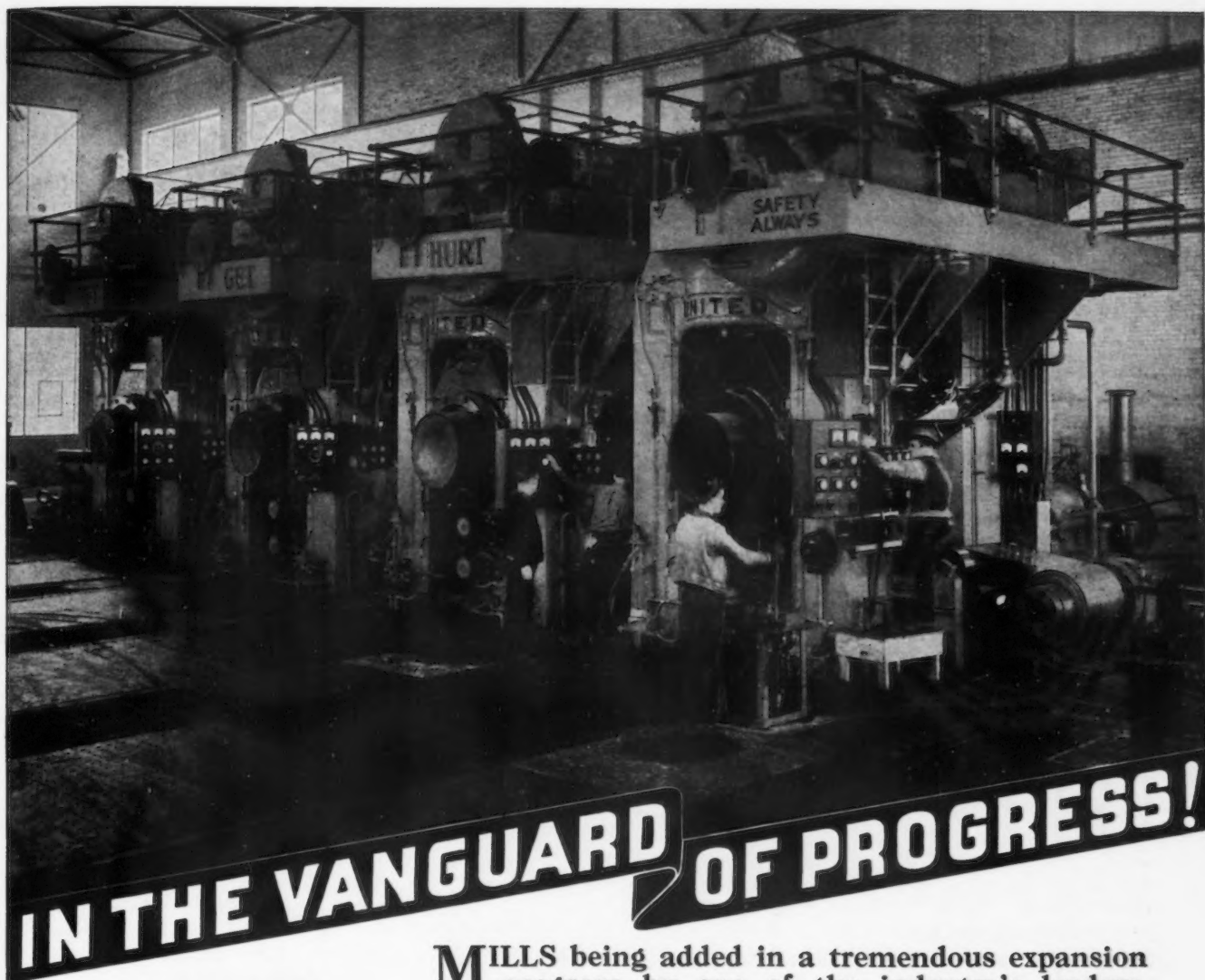
Rheem Mfg. Co., Richmond, Cal., manufacturer of steel barrels, drums and kindred equipment, has let general contract to W. A. Brunet, Shell Building, Houston, Tex., for new one-story plant at Houston, 160 x 240 ft., with L-extension, 60 x 80 ft. Cost about \$100,000 with equipment. Houston offices of company are at 1401 Lockwood Drive.

Limoneira Co., 117 North Tenth Street, Santa Paula, Cal., fruit packer, has plans for one-story addition, totaling about 30,000 sq. ft. floor space. An air-conditioning system will be installed. Cost about \$80,000 with conveying, loading and other mechanical-handling equipment. Roy C. Wilson and Goffrey N. Lawford, Say Road, are architects.

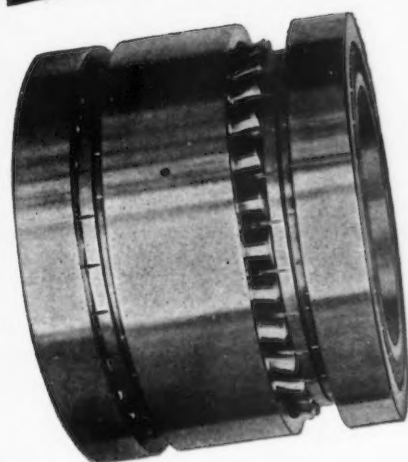
Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 22 for one motor-driven initial or pinch-type bending rolls machine (Schedule 940) for San Diego Naval Air Station; one 1½-ton crane truck (Schedule 983) for Seattle yard; until June 25, one motor-driven light-duty engine lathe (Schedule 935) for Mare Island yard; one motor-driven sensitive drill press (Schedule 937) for Puget Sound yard.

Associated Meat Producers, Inc., Twin Falls, Idaho, meat packer, is considering meat-packing and processing plant, with steam power house, machine shop and other mechanical departments. Cost close to \$250,000 with equipment. Chamber of Commerce, Twin Falls, is interested in project.

Northern Pacific Railroad Co., 176 East Fifth Street, St. Paul, Minn., has let general contract to Standard Construction Co., Perkins Building, Tacoma, Wash., for one-story addition to engine house and shops at Pasco, Wash. Cost about \$40,000 with equipment.



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The bearing shown is one of 20 furnished for this new mill in the Warren District. It is a BANTAM 4 Row Tapered Roller, 26" I.D. x 42" O.D. and 25½" long.

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Steel Markets in Domestic Air Conditioning

(CONTINUED FROM PAGE 45)

all of these cases, the use of ducts is necessary, so that the installation of any of the Carrier systems would call for considerable sheet metal work. The outlet cabinets and cases of the separate units are usually of 18 gage sheets, finished in varying styles.

In addition to all these, Carrier also offers a portable summer air conditioner of walnut-finished steel, all in one cabinet, which is plugged into a wall socket just as is a radio, and circulates cool, clean, de-humidified air in individual rooms or offices.

Installations All in New Homes

Carrier salesmen state that nearly all of their domestic installations are in new homes, and that air conditioning is preferred, as opposed to summer cooling alone, although this feature is often added to the winter equipment. This company has been interested in home air conditioning for more than 10 years, but only recently has it turned to moderate cost homes, having previously concentrated on larger residences where installed costs averaged over \$2,500.

Another prominent company in this field is the York Ice Machinery Corp., York, Pa., which is featuring its system in a real estate development near Pittsburgh. A group of small model homes, completely equipped, and including a central system of air conditioning, is being built in an 80-acre tract, each house to cost from \$7,000 to \$8,000. Both summer and winter air conditioning are available, and by the use of the central plant, combined with what is known as "zone control," it is possible for the small home owner to spread the benefits of air conditioning over a larger cubic area, while using more compact equipment, which requires less power and consequently costs less to operate. The zone system of control is simply an arrangement whereby the central unit cools the living and dining rooms during the day and the bed rooms at night, thus effecting substantial savings in operating costs, in addition to an initial economy gained by the use of a smaller unit. The York line includes also portable room cooling

units which are plugged in like radios. Central systems, of course, require sheet metal duct work according to the size of the house. These latter must be connected with a source of heat, steam, or hot water, so that the conditioned air may be circulated warm throughout the house. The heating unit is self-contained. Practically all of the York installations include provisions for summer cooling, and winter air conditioning may be added later if desired.

An oil-fired warm-air conditioner has been developed by the General Electric Co. Schenectady, N. Y. that forces atomized oil downward to meet with an upward secondary air stream, producing a floating white-heat flame 5 ft. long that turns upward on itself. This principle, according to the company, makes it possible to burn low-grade fuel oils, and effects remarkable economies. Combustion is said to be so complete that furnace and flues seldom need cleaning, and no obnoxious odors remain to annoy the users. The supervisory and protective electric control series installed on this machine have never been used to such an extent before on any household equipment, G-E claims. All the parts in the conditioner, from the flame detector to the thermal control, special controls, and the little motor that pumps and blows air, were designed for this particular service and built by the one company.

The Market for Steel

Just what does the steel industry stand to gain by all this enthusiasm for air conditioning? In the first place, whether conditioning be partial or complete, sheet metal ducts carry the air from the central conditioning unit in the basement to the various rooms, so that all companies making use of this system are potentially large customers of steel mills. In the smallest unit of the Kelvin home approximately 575 lb. of galvanized sheets is used in the ducts exclusive of the furnace sheathing, while Gar Wood Industries reports that its average installation calls for about 1000 lb. of galvanized steel in the ducts. In

addition, large quantities of sheets are being used in furnace construction in connection with these units, and the increase in building will require more steel for use as flashings and roof drains. Room air conditioners and cabinet-type outlets are nearly all made of special walnut or grained finish steel sheets.

This movement in favor of air conditioning is bound to have an effect on the sale of direct radiation heating equipment. In certain cities, Detroit, for example, there has been a swing away from steam or hot water types in the past year. This has meant loss of business in steel pipe and cast iron radiators that, on a weight basis, will probably amount to much more than any sheet metal going into ducts. This, however, may be offset to some extent by a wider use of welded steel in heating construction. Another counteracting factor will be the use of previously discussed combination systems of direct radiation and conditioned air, such as is advocated by the American Radiator Co.

The public seems definitely interested in year-round conditioned houses. The desire has been created through public contact with stores, theatres and restaurants that have been cooled in summer. Some of this work has been carried too far, however, and a reaction has set in to a certain extent, especially in the Middle West, where the differential between the air-cooled spots and the 100-deg. summer temperatures is often too great for comfort. This tendency is expected to be reduced, however, as more is learned about the physiological factors involved. People have been talking about air conditioning in homes for years, but up until very recently they have had no means of satisfying their desires because of the prohibitive costs. It is certain, now, however, that everyone who conditions the air in his home interests many others, so that the idea is constantly gaining momentum, more sales are being made, and more steel is being consumed.

In the first four months of this year the installed cost of air conditioning equipment, as reported by the Air Conditioning Manufacturers' Association, was \$41,311,301, which was 82.7 per cent of the entire 1936 total of \$49,942,301.